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2015



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NEW!
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3/8" crowfoot, oxygen sensor - 20mm	£3.84	£4.61
3/8" oxygen sensor socket - 8mm	£3.66	£4.39
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NEW!
2015

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Welcome



Kit car journalist for over 14 years. Built a Sylva Riot and raced a Tiger Avon for several seasons. Has run numerous kit cars as daily drivers over the years.

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When news of the Ultima Evolution burst on to the internet on the evening of 6 April, it was a big deal. Anything with a four-figure power output and a 0-60mph time of 2.3sec is going to go viral, break the internet and do all those other things that anyone marketing a product online is keen to do. We joined the stampede and shared the news through our social media channels immediately, and made contact with the Ultima factory the very next day to get more detailed information for a news item in the magazine.

The rest of the world was also on the phone to Ultima, and its website crashed. Yep, the 1020bhp Evo was big news. I tentatively asked whether we could be the first kit car magazine to drive the car, and got a yes. But we'd have to wait: the demonstrator had a busier calendar than most A-list celebrities. I assumed that we were queued up behind mainstream automotive media organisations, and patiently waited for our chance to drive the car. But it turned out that all of the press was being kept at arm's length for a while – and Stent's eight-page article in this issue is the first review of the car you can read anywhere.

It's not often that we can claim a world exclusive in all conscience. Sure, many of our first drives *are* the first review you'll read anywhere, but that's often because many of the cars we review are, sadly, only ever confined to the kit car press. Ultima's global recognition gives our 'World Exclusive' cover line credibility. When news of the Evolution broke back in April, it spread around the globe. Now you can find out what it's like to drive – and you can do so first in CKC.

From one well established kit car marque that has just written the opening scenes of its next chapter to another where the next chapter is to be written... by somebody.

Jeremy Phillips at Sylva Autokits has been rather fire-fighting rumours of his retirement since he announced that his company is for sale a couple of years ago – but now it is official, he has supplied his last ever kit. As you can read in the news, the final Vectis package went to a customer last month, and he has redoubled his efforts to find a buyer for the whole company.

In Jeremy's typically humble fashion, this news didn't reach us in the form of any official press release. Instead, he merely mentioned it in passing when I called him to ask him a question about the driveshafts on my car. He also told me that he is currently building a lightweight Vectis for himself, which will do without carrying the donor MGF's entire rear subframe. He added: "But I'm not sure whether you'd still be interested in that now that I'm retired." Of course we are! And we'll be featuring the car once it's complete.

But in the meantime, there's the task of finding the right person to carry on with Sylva Autokits. Jeremy has crafted a fine reputation of building good honest sports cars that handle and perform excellently, his name virtually being a synonym for that of the company he founded in 1982. With the right marketing push (something that Jeremy will readily admit is not his forte), the marque has plenty of potential. So who is going to take it on?

Adam Wilkins, Editor

 @AdamWilkins_



FEATURES

18 First Drive – Ultima Evolution
CKC gets the world exclusive first drive of the 1020bhp Ultima Evolution.

28 Out & About – Herts Fortnight
Gary Axon finds himself visiting several events in the Hertfordshire area.

30 Out & About – Beachbuggin
James Horsley heads for Southsea and a large VW summer meet.

32 The Story Behind... Davrian
Richard Heseltine charts the sometimes confusing development of Davrian.

38 Reader's Car – GBS Zero
The second part of our feature on Jim Martin's supercharged GBS Zero.

44 Kits I've Owned
Adam Wilkins remembers all the kit cars that he's owned and, hopefully, enjoyed!

48 First Drive – GD427 Mk3R
We drive GD's revamped Mk3R 427 replica. Big attitude with smooth power.

54 Top 10 – Wooden Kit Cars
We choose our top 10 kit cars and specials that have been made of wood!

58 Road & Track – Marlin Sportster
The traditional styling of Marlin's Sportster conceals a highly entertaining track car.



TECHNICAL

68 Readers' Cars – Exocet Double

Chris Stagg and John Gilbert built their MEV Exocets in tandem.

76 Our cars

For once, it seems that we are actually using our cars. It can't last!

80 Tool Test – Screwdrivers

James Horsley has been trying out innovative alternatives.

84 Running Reports

More news from real kit car builders in the real world.

92 Products

A round-up of the latest gear for your garage and your car.

94 Silencing

Everything you need to know in order to silence your car effectively.



REGULARS

3 Welcome

It's not often we get a world exclusive at CKC, but the Ultima is worthy of it.

6 Up Front – News

Three new kit cars revealed.

12 Up Front – Clubs & Lifestyle

These are the pages where you can tell us what you've been doing with your kit car.

15 Events Diary

What's happening when.

17 Outside View

Heseltine looks at our use of donor cars that might one day be valuable classics.

64 Letters

A chance to have your say.

98 Between The Lines

Insider knowledge revealed.



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Jakabi Abster: MGF restyle for 2015

Paul Goldsmith's Jakabi Design operation has recently revealed its latest project – the MGF based Abster. It follows the Audi R8 inspired Toyota MR2 Mk2 JA8 which broke cover last year, but this time there are two key differences: the Abster is an original design, and it will be commercially offered as a kit.

Paul works as a clay modeller for a mainstream manufacturer by day, so it's no surprise that the Abster, like the JA8 before, has a high quality surface finish and very good shutlines throughout. But more than that, it's clear that Paul has an eye for styling and detailing. The small 'splitters' at the lower edge of the front bumper, for example, are a very contemporary styling cue.

The car's 'face' is dominated by a Ford Fiesta grille and headlights. The former is available in either with a chrome-look finish or in black from the Fiesta ST, as per the demonstrator. From there backwards, the Abster has distinctive, sharp lines that completely disguise the rounded styling of the MGF underneath. Only the windscreen and frame



remain as external visual clues to the car's identity.

Paul is particularly keen to push the car's all-British status, picking up on the UK's heritage for building two-seater sports cars.

The car pictured here is effectively the buck from which moulds will be taken, so there are some detail improvements that will be evident from the first kit onwards. It's hoped that the

first GRP kit will be fitted to a car before the end of the year. Kit pricing, therefore, is still to be confirmed but expect it to be around the £3500 mark.

jakabi.ja830@yahoo.co.uk

GT40 styling; Elise underpinnings

Was it ever more than a matter of time before somebody offered a body swap for the Lotus Elise? Replacing the Elise's panels with a new look while retaining its excellent dynamics has the potential to be an appealing package. Nigel

Thornton is selling this GT40 replica as a project – and the GRP panels are hung on the unmodified chassis of a Vauxhall VX220 (which is the same as a Lotus Elise's). Nigel bought the project at the stage it's at now, with the intention of finishing



the development work and selling central tubs for builders to then fit the front and rear panels from other GT40 replica kits. He has everything at his house in France, but is soon relocating to a Greek island and now needs to sell the whole lot.

He bought the project from an Essex based classic car specialist who was responsible for the work you see so far.

It's understood that it's based on old second-hand GT40

replica panels with the centre tub modified to fit the VX220 chassis. The front and rear bodywork, therefore, required no modification to fit and gives it a pretty authentic shape at each end, although the wheelarch positions have been altered to suit the Lotus dimensions.

The whole lot is being offered at £12,500, which opens up the option of either finishing off the one car and keeping it as a one-off, or continuing with the plan of offering it as a commercial kit. nigel.thornton543@orange.fr



FACT

The MGF has some kit car heritage of its own. The Rover team that developed it studied a GTM K3, which also used Metro parts.



RPS reveals MGF based RPX

Along with the Jakabi Abster above, RPS has also revealed an MGF body conversion this month. The new offering sits alongside its MGB based RPS RP251 and means that the company can now offer kits for two generations of MG sports car.

Called RPX, the name hints at MG's erstwhile X Power tuning arm, while the pumped-up styling is similar to the treatment MG was giving Rover saloons and hatchbacks up until its demise in 2005. Quoted inspiration for the RPX are the MG SV and Lotus Elise, the latter being most evident (to our eyes) in the kicked up lip spoiler and circular tail lights. The TF headlights give the car an updated look.

RPS showed the car in its mock-up form seen here at an MG show at Gaydon. The white panels are production ready, with the rest of the car temporarily finished in grey primer.

As well as the bodykit, you can also see RPS's own hardtop for the MGF/TF, which is available as a stand-alone item.

The company has also taken on the Vee Bee Wing project. When former owner Vic Birch decided to sell tooling and rights to his MGB replacement wings because of health problems, he thought it would be a good fit with RPS's existing offerings and approached the company.

In other news from RPS,



the company has relocated – slightly. It has moved to a bigger unit on the Lowestoft, Suffolk, industrial estate that it's located on.
www.rps-ltd.info



Tiger Racing open day

Tiger Racing is opening the doors to its Wisbech, Cambridgeshire, factory on Saturday 3 October. As ever, it's a chance for existing owners to meet, and for potential customers to see the factory, talk to Tiger's staff and owners all in one place. As well as the range of Seven-inspired roadsters that Tiger is best known for, the Audi powered ERA 30 will also be on display – as driven for our Stoneleigh 2015 issue.
www.tigerracing.com



For sale: CKC cover car

James Grayley's Technic 356, as featured on the cover of the last issue of CKC, is for sale. James is making way for his next project, so the recently-completed Porsche replica is now looking for a new owner. His asking price is £19,500, and you can email him on the address below.
grayleyjames@gmail.com



Exocet - USA style

Here's an indication of how differently they do things in the USA. Exomotive's latest Exocet build, dubbed XP-5, features a Chevrolet LSA V8 engine taken from a Cadillac CTS-V. That's right – Exomotive has taken the Mazda MX-5 and added a 525bhp V8. It drives through a 6-speed manual gearbox and has a wing from a NASCAR.

That having been said, the UK isn't short of a highly powerful Exocet – and we'll have details of that in our next issue. Watch this space...

www.exomotive.com
www.mevltd.co.uk





More than adequate

A lot of column inches have been devoted to Ultima this month, and quite rightly so. To create a usable car with over 1000bhp is not easy. In fact, I suspect it's very difficult. But I also suspect that rather than thinking on the technical achievement, most will be asking 'how fast is it?' and 'do you really need that level of performance?'

Answering the first question is sort of easy, but I must admit to approaching this test drive with some apprehension... I was concerned I would be disappointed. After all, how much faster can a car be than, say, the 650bhp Cobra replica I drove a month or two back?

In reality, 1000bhp makes the Ultima shockingly fast. It is another level of fast. Years ago I was fortunate enough to find myself in the passenger seat of a GT40 replica with Jonathan Palmer beside me. We were at Bruntingthorpe Proving Ground and he was doing some high speed laps. At one point a coned out chicane had been created and we passed through it at a simply unfathomable speed, without hitting anything or losing control.

It was mind-boggling car control of a level I have never experienced before or since. Even though Palmer had struggled in F1, it demonstrated to me how top level sportsmen (in any sport) aren't simply very good... they are actually at a completely different level, even to those county players who are themselves better than you or I. It's like they are playing a different sport altogether. And that's how the Ultima's 1000bhp feels, compared to anything else.

As for the other question... of course you do!

Ian Stent

ian@performancepublishing.co.uk

Pedal-powered promotions

Greg Murrell, creator of the Citroën 2CV based Flyer, was in touch after the car's recent appearance in our Top 10 feature. He came with news of his latest project, a cyclecar 'truck' that uses running gear from Cyclesmaximus, the firm that makes 'pedicabs' on his own aluminium chassis. The bodies will be made from lightweight (thin) GRP.

As we'd expect of Greg's work,

it has really neat styling. The idea is that they would be used for promotional purposes at shows and events. You can picture it being used by, say, an ice cream vendor.

If it proves successful, Greg has other body styles on the drawing board which will use the same platform. We wonder if there will be a newsagent van from which to sell magazines...? gregmurrell77@aol.com



From the ads: MEV Rocket



This MEV Rocket looked rather striking in its eBay listing thanks to its metallic paint and powdercoat finish. It's registered with a 2010 plate and has covered just over 1000 miles. Its condition appears to reflect the light use that it's had. In other ways, its specification isn't particularly out of the ordinary: 2.0-litre Ford Zetec engine, Gaz suspension, one owner. It's being offered by a dealer in Essex that otherwise lists run-of-the-mill mainstream cars.

MEV is currently working on what will effectively be a successor to the Rocket, the Ford Focus based original having gone out of production when Road Track Race ceased trading. Details are a little sketchy at present, but we do know that the new car will use the Toyota four-cylinder which, in its 190bhp VVTi guise, was used in the Mk7 Celica.

Aristocat gains Ozzie approval

It's well documented that the Australian regulations controlling kit car approval and registration are very strict – but that hasn't stopped Mac Boulton getting his Autotune Aristocat on the road in Oz. Last year, the Lancashire based company dispatched a number of kits to Australia (all ordered separately by their respective customers), and this is the first of those cars to have been completed and registered.

www.autotuneuk.com



Want to join the bodykit making craze? Aspire project for sale



The Aspire, a Mazda MX-5 based body conversion, is currently being offered for sale by Peter Mileham, who manufactured and marketed it a few years ago.

His intention was originally to modify the kit to suit a Mk2 MX-5 (it currently fits the Mk1), but that plan was put on ice. Now the complete project, including the moulds, some spares and a donor car with a colour-matched hardtop, is for sale. "I'm not looking for a large amount of money but would just like to see the product developed successfully by someone in the business," says Peter.

peter@mileham.net



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STR: New life for old Ferrari



We're used to seeing kit cars that look like Ferraris – but here's a Ferrari donor that's being used to build a kit car. OK, it's not the first time we've seen a Ferrari engine used in a kit car, but it's an unusual enough occurrence to have piqued our attention when Lister Bell showed photos of this Mondial donor that's being used for a factory build on its Facebook page.

Lister Bell's post described the Mondial as "quite possibly one of the least desirable examples of a Ferrari Mondial. The pictures don't really do justice to the state this car is in! The car is an early 1981/2 model which appears to have been subjected to an attempted conversion from hard top to a soft top at some point in its life."

Still, the 3.0-litre 16v V8 is a work of art, and will be treated to a full rebuild, individual throttle bodies and aftermarket management before it's transplanted into a Lister Bell STR Lancia Stratos replica.

www.listerbell.co.uk

Final Sylva kit supplied; company for sale

It has been no secret that Jeremy Phillips has been looking to sell Sylva Autokits, the company he founded in 1982, in order to retire. He has recently made a significant step in that direction by earlier this year making a final batch of five Vectis kits – and the last one has recently been collected by Laurence Burrows of Welwyn, who has officially become the final customer of the company in its current guise.

While there's no doubt that Jeremy will continue to offer support to existing Sylva owners – he's as much a kit car enthusiast as ever – he has now put the tooling into storage while he seeks a buyer for the business. Similarly, any new owner of the company could expect to benefit from Jeremy's knowledge and experience during a hand-over period.

The sale will include all the tooling necessary to continue production of the MGF based Vectis and Ford based J15.

We have no doubt that there is a market for these cars: it's affordable, lives up to Sylva's reputation for handling and performance and looks great.

But much more than that, the buyer would also be taking on a well established company with an enviable following. Within specialist car circles, Sylva Autokits is revered – not least because of the numerous championships the

company's products have won.

Production of Sylva models being paused is significant: the firm has been a staple of the kit car market for over 30 years. But it also represents a significant opportunity for someone to take on and expand a marque that is not only very well known but also highly regarded by those who know the market.

www.sylva.co.uk



Will some classics face IVA?

There has been a lot of concern amongst classic car owners lately regarding a letter (reproduced on the right) that has been sent from the DVLA to some registered keepers of historic vehicles.

The issues it raises will be very familiar to kit cars owners, as it discusses newly built chassis, IVA tests and Q registrations. While it will be of great concern to those owners of classic cars which may or may not be correctly registered, it presents nothing new or scary to kit car owners; it's simply a wider enforcement of the regulations that our industry adapted to in 1998 with the introduction of the Single Vehicle Approval test (now Individual Vehicle Approval).

As such, any kit car that has

been correctly approved and registered will face no questions over its identity. However, we do know that some older kit cars are incorrectly registered, and it has always been our advice to avoid buying such a car. For instance, a kit car that still carries the registration number of its donor car, and is identified as such on the logbook, should be re-registered to reflect its true identity. While we have heard of some cases of the logbooks of some cars being altered by the DVLA, in most cases we would expect it to have to go through an IVA test before being correctly registered. On an older kit designed and manufactured before the introduction of SVA, that could be difficult and costly.

It seems that since the DVLA's closure of its network of Local Offices, and the centralisation in Swansea, it is now imposing a more consistent approach to older vehicle registrations, and that's how some incorrectly registered classic cars have come to light. But it reveals nothing that the kit car industry hasn't been complying with for 17 years.



The DVLA's letter in full

"I am writing to you as our records show that you are the keeper of a 'Historic' vehicle. The Driver and Vehicle Licensing Agency (DVLA) has been made aware that the recorded date of manufacture for a number of vehicles may not be accurate. Initial investigations have confirmed that some historic vehicles have been built using replica/replacement parts or a mixture of period and new components and have therefore been incorrectly registered. A period of manufacture date has been recorded in error and a registration number allocated based on this date.

I hope you will appreciate that DVLA has a legal responsibility to ensure that our records are accurate. This letter aims to provide you with advice and guidance on how DVLA will look to resolve this matter. DVLA require information about the provenance, construction and origin of your vehicle. You should provide as much information about your vehicle as you can. This could include: copies of receipts, Id documents such as logbooks, copies of historical race sheets or reports, recent/historical photographs, copies of old sales advertisements or extracts from books.

We also require information on the age and origin of major components your vehicle comprises of; such as chassis, engine, axles and steering assembly. You should also advise if the vehicle has been rebuilt, restored or entirely reconstructed in the last 25 years. The relevant owners' club may be able to assist. The information should be sent to: Vehicle Registration Policy, Strategy, Policy and Communications Directorate, D16, DVLA, Longview Road, Swansea SA6 7JL.

Using this information, together with the documentation that was provided at first registration, we will assess whether a Historical classification is appropriate for your vehicle and if the date of manufacture is correct. If the vehicle has been recently built using a new or replica chassis, it is likely the DVLA record will be incorrect. You should be aware that we may contact the relevant owners' club to help with our investigations.

Once investigations are complete, we will write to you again explaining our conclusions. If any amendments are needed to the information DVLA hold on the vehicle record, these will be made and a new vehicle certificate issued. This could involve the issue of a different registration number. In addition, in some cases Individual Vehicle Approval may be required and/or a Q registration number may be appropriate.

Please be aware that while these investigations are ongoing, applications to notify a change of vehicle keeper will not be processed.

Jim Vale

Team Leader, Vehicle Registration Policy"

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Skegness MEVs

MEV's Stuart Mills organised a run out for MEV owners recently, starting at the factory and ending up on the seafront at Skegness. Twelve cars were involved in the run, meeting for an early morning bacon buttie at the company's Mansfield unit, before heading off in convoy for the 1.5 hour drive to the seaside resort.

"We were greeted by thousands of gobsmacked tourists and holiday makers who had clearly never seen such a spectacle," comments Stuart. "We were so busy answering questions all day that when we eventually left the seafront I realised I had not seen the sea or had fish and chips... not even an ice cream and no aniseed rock! The drive home was beautiful, the sun was going down, it was still very warm and my jaw ached from smiling all day. Perfect."

As well as the factory Replicar demonstrator, cars included several Rockets, Sonic7s, tR1kes, an Exocet and Mevster. For more information on the manufacturer or the club, see below.

www.mevltd.co.uk

www.mevowners.co.uk



Wood you believe it?

Just when we decide to focus our Top 10 feature on wooden kit cars (see page 54), a press release drops into our inbox regarding the restoration of an all mahogany Mercedes gullwing

creation. The exact history of the 'car' remains a mystery, but it was spotted by an enthusiast on the Isle of Skye who then took it on and charged a company in County Durham, Furniture Clinic, to restore the surface of the wooden replica, which had dulled over time. The 'Mercedes' has no mechanical parts as far as we can see and is effectively a wooden sculpture, thought to be one of just two made.

www.furnitureclinic.co.uk



Buggy Club grows

We certainly get the impression that the classic beach buggy is having a renaissance over the last few years, with more and more being restored and put back on the road. Dave Watts from Beach Buggy Club UK has been in touch to draw

attention to a forum which is now a central meeting place for the Southern Dune Buggy Club, South West Buggy Club and Midlands Buggy Club. The forum boasts over 850 members and continues to grow! A fantastic effort. www.beachbuggy.info





GDs gather at Blyton Park

Owners of Gardner Douglas 427s and T70s gathered at Blyton Park recently for a track day and opportunity to meet other owners.

Although the day was run by Javelin Trackdays, GD Cars had booked a number of places at the venue exclusively for its customers, and lots of them took the opportunity to stretch the legs of their cars.

To find out when the factory is planning its next event, head for the website...

www.gdcars.com



Rest and be thankful

The Cobra Drivers' Club had its now annual gathering at the Rest And Be Thankful hillclimb at Glen Croe in Scotland recently.

The third running of the event witnessed 26 entrants in a variety of Carroll Shelby focused

machinery including Cobras, Tigers, Mustangs, GT40s and Ford GTs.

'The Rest' formed the focus of an event which began at Deanston Distillery in Doune, followed by a 65 mile scenic tour taking in the stunning Dukes Pass and Loch



Lomond before arriving at the hillclimb.

Entrants then experienced two full runs on the course before travelling on to Inveraray Castle for a late lunch and prize giving ceremony.

Membership of the Cobra Drivers' Club is free.

www.classic-car-tours.com

www.thecobradriversclub.com

In brief

GE Classic Motor Events has announced the date for the 2016 London to Brighton Run for kit and sports cars. Sunday 5 June is the date to set aside in your diary.

2016 will see a return to Mercedes-Benz World at Brooklands for the start, before a new route down to Madiera Drive in Brighton.

www.classicmotorevents.com



Autotune always attends the Jaguar Drivers' Day at Wroxall Abbey each year, and this year the company's Carolyn Taylor bumped into Norman Dewis OBE, Jaguar test driver for many years and recently celebrating his 95th birthday. When offered a D-Type to drive round the parade, Norman apparently misheard and thought they wanted fast laps, subsequently catching up the back of the parade, with a female passenger onboard!

www.autotuneuk.com



Although we sadly don't have any car-shaped cakes this month, SHACC first lady, Yoland Brown, sent in this shot from her wedding to Roger a year or two ago (1964 to be precise). She comments of the picture, "They didn't make wedding cakes in shapes or with pictures in our day, but you might like this one with Roger taking more interest in the car than in me!"

From the way Yoland's wielding that knife, we doubt he made that mistake again!

Send in your pics and we'll get them in the mag here.

ian@performancepublishing.co.uk



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2015 Events

There's plenty to entertain you and your kit car. Here's our diary of the events over the coming 12 months that have caught our eye. If you know more, tell us and we'll get the word out.



SEPTEMBER

26th-27th

Sywell Classic: Pistons And Props

Sywell Aerodrome, Northamptonshire.

Satnav: NN6 0BN

T: 01775 768661

W: www.sywellclassic.co.uk

An increasingly popular event.

OCTOBER

Sunday 4th

Goodwood Breakfast Club:

Vee-Power Sunday

Goodwood Motor Circuit, West Sussex

Satnav: PO18 0PX

T: 01243 755060

E: cooked@goodwood.com

NOVEMBER

Sunday 1st

Goodwood Breakfast Club:

Bahn-Stormer Sunday

Goodwood Motor Circuit, West Sussex

Satnav: PO18 0PX

T: 01243 755060

E: cooked@goodwood.com

7th/8th

The Footman James Bristol Classic Vehicle Restoration Show

Bath & West Showground, Somerset.

Satnav: BA4 6QN

T: 01507 529529

W: www.carsandevents.com

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dedicated hall for kit car clubs. Contact

CKC directly to register your interest.

Limited indoor space.

Saturday 21st

totalkitcar LIVE

Brands Hatch, Kent

T: 01883 372 085

E: stevetotalkitcar@yahoo.co.uk

W: www.totalkitcar.com

Satnav: DA3 8NG

2016 Events

JANUARY

14th-17th

Performance Car Show

NEC, Birmingham

Satnav: B40 1NT

T: 0844 581 1419

W: www.performancecarshow.com

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Performance Car Show is looking

like must see viewing for the kit car

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MAY

1st/2nd

The National Kit Car Motor Show

Stoneleigh Park, Warwickshire

Grosvenor Shows

Satnav: CV8 2LZ

T: 01406 372600

W: www.grosvenorshows.co.uk

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Saturday 14th

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Llandow Circuit.

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E: ian@performancepublishing.co.uk

W: www.completekitcar.co.uk

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JUNE

Sunday 5th

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W: www.classicmotorevents.co.uk

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Retroford Water rail - Zetec E - £216.00
Raceline Water rail - Duratec HE 14 - £255.26
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Richard Heseltine

"How many Arkleys have since been returned to their original form? For me, an Arkley is infinitely more interesting than a Spridget, but I understand why MG and Healey types might feel compelled to stage an intervention. On the flipside, I am sad that another conversion from the same period hasn't been treated with greater respect"



Respected classic car journalist Richard Heseltine has been a major player at *Classic & Sports Car* and *Motor Sport* magazine before becoming a sought after freelance journalist. But he also happens to be one of the most knowledgeable kit car buffs you'll ever come across.

I was interested to read in the August issue about the Dutton B-type that had been built way back when, using a Ford Lotus Cortina donor car. I must admit to stifling a giggle at this, given the sort of money this performance saloon icon nowadays reaches in even the ropiest condition. But then it shouldn't come as that big a surprise that what we now consider an honest-to-god classic was once sacrificed in order to build a kit car. Nobody can see into the future, save perhaps for self-proclaimed psychics on cable TV shows, but chopping up something old and worthless in 2015 might be viewed as a travesty years down the line.

It isn't something that I had ever given much thought to, but then I was recently contacted by a friend in the US who had bought a Porsche 914/6 that had been given a Ferrari Testarossa-influenced make-under back in the late '80s. As he correctly pointed out, these cars were once worth buttons but now they're going for serious money so it will be restored to factory spec. It's simply worth more in its original configuration than with comedy non-functioning vents glued to each flank and a rear spoiler the size of an aircraft carrier.

Given that Porsche Boxsters are now serving as donors for clones of exotic supercars, will history repeat itself decades down the line? Will Porsche types be 'rescuing' converted cars in 2040? Should we even care? Well, the thing is, I don't particularly like this sort of thing, but there are exceptions. Despite myself, I do feel a certain affection for

the Spridget-based Arkley SS conversion which sold in vast numbers back in the 1970s and well into the '80s. It was a huge hit in the USA, too, which is where the manufacturing rights ultimately headed. How many Arkleys have since been returned to their original form? For me, an Arkley is infinitely more interesting, but I understand why MG and Healey types might feel compelled to stage an intervention.

On the flipside, I am sad that another conversion from the same period hasn't been treated with greater respect. The Guyson E12 was a glassfibre redo of a Jaguar E-type V12 devised in the '70s by William Towns for Jim Thompson, a hillclimb ace and manufacturer of bead-blasting machines. Only two were ever made, not least because there was little demand during the fuel crisis for regular E-types let alone used ones, and the Thompson family retain the prototype.

The second car, built for Towns' own personal use, is now an E-type again. I understand why – money talks and there are many who think the Guyson was uglier than sin (I'm not so sure), but I still can't help feeling that it was historically important and, as such, should have been kept as it was. The E12 was styled by one of Britain's premier independent car designers and it appeared in countless mainstream mags in period. Heck, the Thompson car even graced the Cartier Style et Luxe concours at the Goodwood Festival of Speed only a few years ago. The ex-Towns car is now just another E-type – and how boring is that? ■

NEXT MONTH



Gary Axon

In 1982 Gary Axon penned his first published words for *Alternative Cars* magazine, precipitating what has become a lifelong obsession with the more obscure elements within the automotive world. Today he's a leading light in helping to assemble the shortlist of invited cars at leading motoring events, such as the Goodwood Festival of Speed, Revival and the Concours of Elegance.



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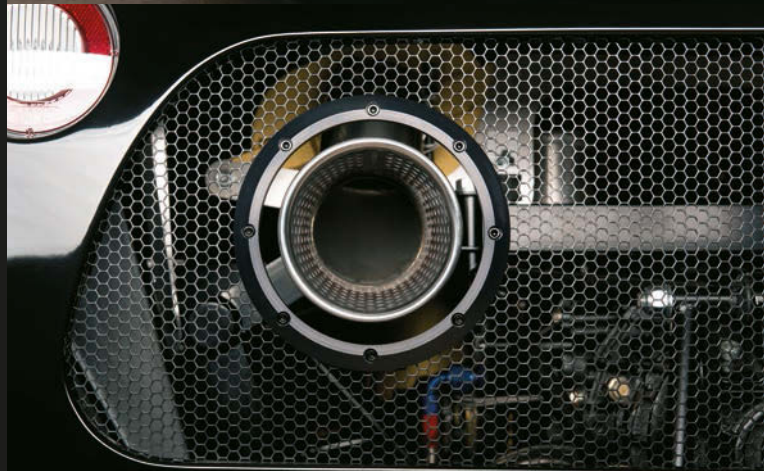


Complete Kit Car magazine is the first media organisation in the world to drive Ultima's latest demonstrator and, for reasons that I suspect are quite obvious, this drive carries with it rather more expectation than most. In case you've missed it, the demonstrator packs a supercharged LS9 based V8 delivering 1020bhp... yes, that's a genuine 1020bhp.

With the latest Golf TSi R producing performance figures (296bhp) that wouldn't have looked out of place on the spec sheet of a mid '80s Ferrari, it's easy to get blasé about brake horse power. Read the mainstream press and you'll find glorified versions of middle management repmobiles kicking out 552bhp (BMW M5), while you can hustle the family down the motorway for a holiday in Cornwall with 582bhp courtesy of an AMG Mercedes E63 estate. These previously insane levels of power are increasingly accessible. Even in the kit car world we're becoming accustomed to some serious stats... only back in the August issue did I get behind the wheel of AK Sportscars' 650bhp 427 Cobra replica... the most powerful car I've ever driven, until now.

Ultima has launched itself as a genuine hypercar contender with its new 1020bhp Ultima Evolution. We drive the fastest car ever tested from the kit car scene.

Words: Ian Stent **Pictures:** Ultima, Damian Hock and CKC





Seats are comfortable and driving position is good, although steering and pedals are offset.



Momo steering wheel features Stack display module.



Latest gauges look great and switchgear improved.



LOOK

Because of the height of the supercharger, the air intake is a highly complex shape in order for air filters to fit in optimum position.

LS9 based V8 fills the engine bay once supercharger and air intake is added. It's an extraordinary power unit.

But the new Ultima Evolution's engine doesn't just provide a small hike in power... it's not even a giant leap – this is more like another planet. 1020bhp is right up there. Just to be clear, the McLaren P1 develops 903bhp, the Porsche 918 875bhp and the Ferrari La Ferrari 950bhp. Even at the lunatic fringe, the Koenigsegg One:1 manages 1160bhp on regular pump fuel, while the Bugatti Veyron peaked at 1200bhp with the limited edition Super Sport. The Ultima's 1020bhp isn't too shabby at all.

“There is not a volume production car in the world that can compete with the Ultima's firepower, and that makes it a very genuine contender within the hypercar echelons”

Of course, where it cannot compete, at all, is on cost. The One:1 would set you back a cool £1,790,000 plus taxes if you were able to buy one (which you can't as the only six being made are all sold out). Even run of the mill hypercars such as the P1 (£866,000), 918 (£657,400) and La Ferrari (£1,150,000) all generate far bigger numbers. In its full fat 1020bhp specification, Ultima can only manage £120,000 for a factory built turnkey example of the car you see here.

What's more, unlike any of the others, Ultima is the only one that will let you build your own 1020bhp hypercar. Around £85,000 will get you the complete component package in your workshop. Head down the ladder a little, and an LS3 version of the Evolution, with fewer bells and whistles, is likely to cost you nearer £50k to home assemble.

While it's fun to throw around a few stats and make what may appear to be unrealistic comparisons, this is one occasion where there is no joke. There is not a volume production car in the world that can compete with the Ultima Evolution's firepower, and that makes it a very genuine contender within the hypercar echelons, where each and every example is largely handbuilt for a select few. As such, the Ultima has every right to be compared with these other rarefied automobiles. And while it may lack exotic structural materials and exquisite interior finishing trinkets... its purchase price is a fraction of its competitors and, we suspect, its running costs will be even less. Make no mistake,



Gear lever and mount are a visual delight.



Floor-mounted pedals are well spaced.



Trigger handbrake better than Mini unit.

the Ultima Evolution 1020 is for real.

Where Ultima also differs from the other aforementioned hypercars (and apart from the fact that Ultima will let you build one of these cars!) is that the 1020 is the halo model within the Evolution range, so you can have a car that looks identical to this, but with a more modest engine installation and at a fraction of the cost. Just as with the previous model, the GTR (now discontinued), the Evolution can be built with a largely standard, carburetted old-school Chevy 350 if the fancy takes you. In reality, few now head down this route and the factory reckons that over 90 per cent of customers opt for one or other variant within Chevrolet's superb LS range of modern injected V8 motors. The 430bhp LS3 is the most obvious contender, with the LS7 being the big hitter, even in relatively modest states of tune.

Although launched earlier this year, work on the Evolution has been ongoing for the last two years, since the launch of Ultima's upgraded GTR chassis in 2013. Completely reappraised and with over sixty changes (most significantly with a larger diameter, welded-in full roll cage), the new GTR chassis was significantly torsionally stiffer than the already impressive previous generation frame.

The new chassis also eased fitment

of the more modern Porsche 996/997 transaxles (good for up to 700bhp), a unit that is more robust than the previous generation G50 gearbox, as well as being more readily available and cost effective. For the demonstrator, Ultima chose to utilise the Porsche GT2 transaxle, an even brawnier set of cogs with a clutch that can cope with the supercharged delivery.

The stiffer frame has even meant that Ultima has been able to re-valve the coil-over damper units, offering improved low speed ride into the bargain without apparently any detriment to its performance at speed.

With the new chassis going out to GTR owners since 2013, the factory began work on upgrades and changes for the new Evolution. As the name makes clear, this is not a completely new model, but rather a hugely significant revamp of the existing formula. Talking to company director, Richard Marlow, the team is still hugely passionate about the period Group C styling behind the original Ultima Sports and subsequent GTR. There was never any thought of a styling revamp. Instead, the original GTR moulds have been given a comprehensive overhaul to further improve fit and finish. Allied to a move to a new specification gelcoat with improved pigment stability, the company feels the



LOOK

Factory currently houses an original Mk1 Ultima and the record breaking Ultima Sports 720.



Ultima factory is compact but always a fascinating place to visit.

One of two Evolutions in build at the factory.



Evolution bodywork is the best ever.

Elsewhere, Evolution changes are extensive and have impacted on almost every area of the new car. From LED front headlights with bespoke machined bezels, to a completely new fuelling system, new quick shift centrally mounted gear lever and new billet aluminium interior door release handles... the upgrades are visible (and sometimes hidden) throughout the car.

To prove the point about the new moulds and gelcoat, the current demonstrator is black, a notoriously tricky colour for any car as it tends to expose any surface irregularities. This car is not painted, but remains in the factory gelcoat finish, and while it may aptly demonstrate the immaculate quality of the moulds and the fantastic ability of the company's laminators... it also has the very obvious added benefit of making the Evolution look utterly spectacular. Assisting in this are the new alloy wheels developed for the car. With their finer spokes and single piece billet construction, the gold anodised new alloys look sensational. Vitally, their forged construction makes them both stronger and lighter (saving

Spaceframe chassis thoroughly revamped in 2013.

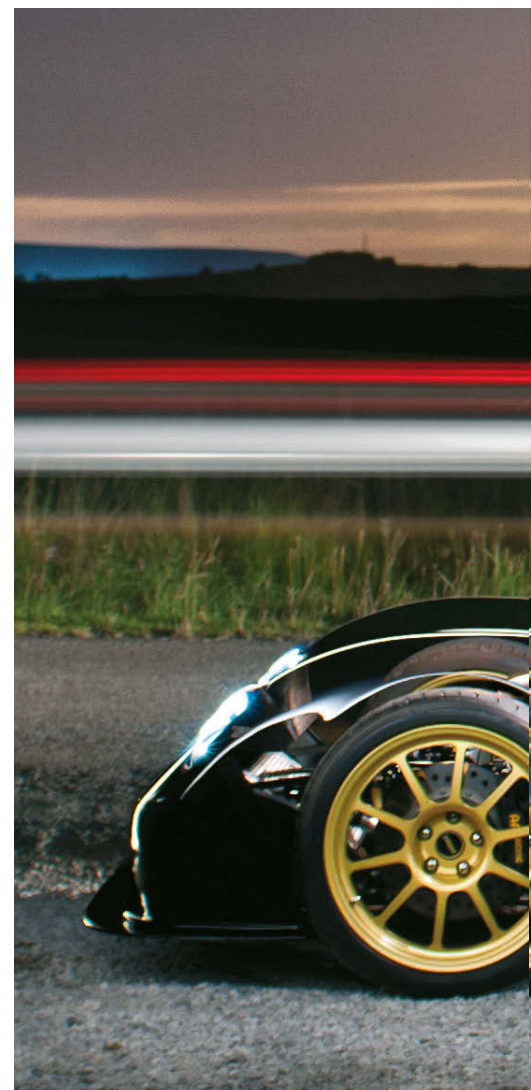


10kg of unsprung weight).

Further external inspection reveals the carbon front splitter and carbon rear wing, along with the new LED front and rear lighting. New Evolution badges are to be found throughout the car (even extending to the gold faced Ultima gauges in the cockpit), while a 'Made in Britain' Union Jack sticker on each flank emphasises a feature the factory finds is increasingly important for its foreign sales...

And selling abroad accounts for almost 80 per cent of the company's orders. To date Ultima has exported kits and cars to 57 different countries and currently there is significant interest from emerging markets such as India, the Middle East and elsewhere. Unsurprisingly, the factory's latest air-con system works brilliantly!

Lift the rear bodywork and the powerhouse of this car is revealed. The Chevrolet LS9 based V8 does a good job of filling the available space, but it's the huge Whipple supercharger and serpentine aluminium air intake and filters that dominate in here. Gold coloured ceramic-coated headers and full exhaust system continue the colour theme (while helping



to reduce under bonnet temperatures), combined with an engine and charger that are black interspersed with carbon detailing. It all looks very serious in here, rather than showroom glam.

Getting into an Ultima has rarely been an elegant or easy exercise, but I doubt the astronauts who clambered into the space shuttle ever complained about the process... the resultant ride was, quite literally, out of this world and, as I was about to discover, while the Evolution remains firmly on terra firma, the experience was certainly otherworldly!

Revised leather trim on Ultima's seats not only looks great but has, from memory of previous drives, improved the comfort levels. Perhaps because this example is a left-hooker, the offset of both the steering wheel and the floor-mounted pedals appears quite marked. The pedals themselves are well spaced, with further room to either side – it's no problem to get comfortable and feel confident in their operation. The long, centrally mounted gearlever falls easily to hand while also providing a spectacular visual feast with its machined detailing, cable and structural base.

In front of me is a Momo steering wheel with (optional) integrated Stack display

unit which can be set-up to give a brain frazzling variety of data. Rather more straightforward to grasp (and use) are the wireless controls for indicators, wipers, headlights, hazards and fan. I can cope with those!

The level of finish in here is a big step up from the more simple, race-focused interior of the previous generation GTR. The roll cage is now leather trimmed, the dash is similarly finished, with better quality switchgear and those very fetching gold-faced gauges. There's even an Alpine head unit with integrated satnav, Bluetooth connectivity and, most importantly, a rear view camera for making reversing easier.

Buckled in, it's time for the drive. Flicking the ignition key fires up the electronics and, most significantly, the fuel pump. The lights on the steering wheel mounted data unit jump into life and flick from one readout to the next before settling slightly madly as the readouts measure fuelling levels and other parameters. But it's the fuel pump that makes you jump... it's loud! The initial priming of the system sounds like something you might hear in a James Bond movie as the alarm goes just before

the baddies' submarine submerges! Combined with the light show on the steering wheel and subsequent deep, deep thunder of the 6.8-litre V8 rumbling into life.... it's an intimidating experience. But then again, with 1020bhp at your disposal, perhaps it should be!

The clutch pedal is remarkably light considering the power and torque (920ft lb) it must deal with. But the gearlever requires

Tech spec

Engine as tested: 6.8-litre LS9 V8, steel crank and rods, L92 cylinder heads, custom forged pistons, Whipple supercharger, 1020bhp, 920ft lb torque.

Engine options: Chevrolet V8, carburetted or fuel injected, small and big block options. LS3 a typical choice.

Chassis: Spaceframe with integral full rollcage.

Bodywork: Coloured gelcoat fibreglass panels.

Suspension: Front/rear – Tig welded double wishbones, cast alloy uprights, double adjustable coil-over dampers.

Steering: Rack and pinion, 2.4 turns lock to lock.

Brakes: 12.7in curved vane vented and drilled discs with AP Racing 4-pot callipers.

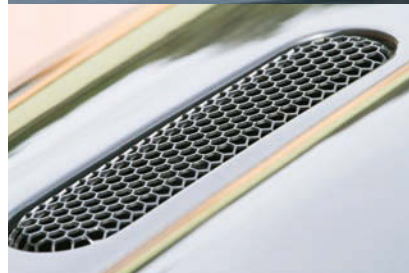
Build cost: From £35,000. LS V8 powered cars typically around £50,000. 1020 comprehensive kit £85,000. Turnkey cars from £75,000 (all prices inclusive VAT).

Contact: Ultima Sports, Hinckley, Leicestershire.
T: 01455 631366. E: richardmarlow@ultimasports.co.uk
W: www.ultimasports.co.uk





Unsurprisingly, latest demo car is the fastest we've driven, ever!



Ultima had new grille material specially made.



Forged billet alloy wheels are light and strong.



Modern LS V8 alongside carburettor unit.

firm and committed action to deliver smooth changes. They are not too difficult to find, just the action required is best described as meaty.

If I'm used to LS engines being silky smooth at tickover and utterly composed in action, the same is not true here. While the engine fires effortlessly, it ticks over with a somewhat menacing chunter. And it's more of the same when moving off and cruising in traffic. Making smooth progress is challenging, with the engine hunting slightly... Ultima asked its US engine supplier to set the engine up so that it popped and crackled on the over-run for more aural entertainment, and it could be that this is the compromise when the engine is at little more than tick-over. Certainly, as soon as you come off tickover revs, it instantly smoothes to the task.

Ride on mixed public road surfaces at low speeds is indeed improved from my memory of previous examples. As soon as you are on the move the steering is light and yet precise, forward visibility through the bubble screen is excellent and the driver's eye view is obviously dramatic. Rearward visibility via the standard wing mirrors is less impressive, providing a perfect view of the rear spoiler, but once you are used to it, checking the monitor for the rear-mounted camera becomes a genuine boon.

We did not drive the Evolution on a race circuit, only public roads, so let's be clear right here that we were only able to briefly touch what this car instantly demonstrates it is blatantly capable of. Without considerably more acclimatisation, you cannot simply plant your foot on the throttle and see what happens. Instead you need to feel your way into the delivery and the results are... extraordinary.

The Ultima accelerates instantly to any input via the throttle, in any gear and at any speed. It's not a question of burying the throttle, but instead seeing how far you can get through the throttle's travel before you bottle out because the acceleration has become so explosive and the speeds perilously close to any legal limit... the transition in acceleration and speed is quite literally that fast. So the gut reaction is to select a higher gear and see if that dampens the response to something more manageable... and it makes almost no perceptible change whatsoever! The Evolution 1020 will seemingly go as fast as you can possibly imagine, as fast as you can imagine it.

The factory stats are worth repeating here... 0-60mph in 2.3 seconds, 0-100mph in 4.9 seconds, 0-150mph in 8.9 seconds! If the figures suggest it should be quick, the reality is something

else again. I've been fortunate to drive cars with 600bhp before, and been able to experience the acceleration of flyweight cars with powerful engines, but I can tell you here and now that nothing has come close to this, in terms of absolute explosive acceleration.

Of course, containing and using 1020bhp is the trick. The Ultima's mid-engine configuration means traction through the massive 335x30 R18 rear Michelin PS2 tyres is impressively maintained, and on the dry roads of my test day you can be confident in the Evolution's ability to keep you pointing in the right direction. The ride which is firm but supple at low speeds gradually softens and when working the engine harder there are some significant forces at work. The double adjustable dampers cope admirably, but I suspect there's some further tweaking of the settings that might settle the car more quickly in these instances.

Handling through sweeping bends is predictable, with minimal roll and clean and direct steering. Once again, we are on public roads with only modest potential to test a car with a rather greater performance envelope than we are familiar with. Thankfully, there are huge discs and calipers on each corner. AP Racing calipers clamp tightly on large 12.7in diameter vented and drilled discs and, via a firm centre pedal, the Ultima's stopping performance is both impressive

and confidence inspiring.

The more I drive this car and sample what it is capable of, the more amazing becomes the feat of creating the car in the first place and, vitally, making it work so effortlessly and seemingly reliably. This is not simply a case of ordering a big engine and slotting it into a standard car. Far from it. From the hugely powerful (and noisy) fuel pump (and associated plumbing) to the cooling system, electronics, braking and other systems... everything needs recalibrating for an engine delivering such vast performance potential. The fact that the Ultima remains so drivable on a public road, that the temperatures all remain stable in traffic... that it stops and starts without fuss... none of these things should be taken for granted in a hand-built car capable of 240mph.

While Ultima has already sold more 1020bhp Evolutions than Koenigsegg will ever build One:1s, the reality remains that most customers will inevitably peg back their aspirations (and budget) and opt for the more standard Chevy LS3 and LS7 installations. I doubt it will feel like a compromise... 430bhp from the LS3 in a car weighing less than a tonne is still a recipe for supercar humbling performance. And with its smoother tickover, quieter fuelling system and generally less extreme nature there's a compelling argument to say this is the 'sensible' option, even before you factor in the financial savings.

Ultima has never been busier. It won't be long before the company will have sold its 2000th car and I won't depress you with the waiting time for a turnkey car from the factory. Thankfully, most of us will want to do the spanning ourselves, at which point the delay from ordering your kit to receiving it is a far more manageable 12 to 14 weeks. Can you imagine how exciting it must be to look at a completed Ultima Evolution and think... 'I built that'.

"We've been completely overwhelmed by the response," says Richard Marlow when considering the impact the new car has had across the globe. "It has surpassed all our expectations."

Seeing the new Evolution, and more importantly driving it, puts the public's reaction into perspective. This is not 'just another' Ultima. While it may not count as a brand new model because of the GTR styling, it's certainly the most significant development at the factory since the GTR was launched back in 1999. And yet it's more still...

Thinking back now, I'm still stunned by the performance that 1020bhp delivers, and the credit that is due to Ultima for containing and utilising such power. While the figures have quite rightly generated huge amounts of column inches in magazines and social media I can tell you here and now that nothing prepares you for the experience of actually driving it. Wow! ■



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• Quick lift
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* steel chassis

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1.25 tonne	£84.99	£101.99
2 tonne	£149.98	£179.98
2.5 tonne*	£139.98	£167.98

LOW ENTRY ONLY 85MM

Clarke RACING

Clarke 2 TONNE TROLLEY JACKS

FROM ONLY £19.98 EXC.VAT

CTJ2001G

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CTJ2MB	DIY	£24.99	£29.99
CTJ2250LP	* Low Profile	£39.98	£47.98
CTJ20LG	Pro Instant	£69.98	£83.98
CTJ2001G	Pro Garage	£74.99	£89.99
CTJ26LC	Pro Long High Lift	£169.98	£203.98

* CTJ2250LP has a 2.25 tonne capacity, has a low entry of only 80mm and includes 2 sockets

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• Ratchet action for quick height adjustment
• Sold in pairs

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CAX-6TBC	6	400-615mm	£29.98	£35.98

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160EN	30-150	£259.98	£311.98

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135TE Turbo	30-130	£239.98	£287.98
151TE Turbo	30-150	£269.98	£323.98
165TE Turbo	30-155	£339.00	£406.80
175TECM Turbo	30-170	£399.00	£478.80
205TE Turbo	30-185	£429.00	£514.80

* was £490.80 inc.vat # was £539.98 inc.vat

Clarke 3 TONNE JACKS

QUICK LIFT

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JACKS ALSO IN STOCK UP TO 5 TONNE

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CTJ300LG	Pro Instant Lift	145-520	£83.99	£100.79
CTJ3000G	Pro Garage	145-520	£84.99	£101.99

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• Swivel castors for easy manoeuvrability

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CMC50	£44.99	£53.99

Clarke NO GAS/GAS MIG WELDERS

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• Thermal overload protection
• Turbo fan cooled
• Easy conversion to gas with optional accessories

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MIG 145	35/135	£149.98	£179.98
MIG 152	40/140	£164.98	£197.98
MIG 180	40/160	£179.98	£215.98
MIG 196	40/180	£199.98	£239.98

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For home user, automotive and industrial applications.

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115N	30-110	£64.99	£77.99
EA200	60-200	£87.99	£105.99
160N	40-150	£67.99	£81.99
190N	50-185	£94.99	£113.99
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• Inc. 17, 19, 21 & 23mm chrome vanadium sockets
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BC190	38/180	£89.98	£107.98
BC210C	15/120	£94.99	£113.99
BC410E	35/400	£119.98	£143.98
BC205N	30/200	£169.98	£203.98
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* was £155.98 inc.vat # was £227.98 inc.vat

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- Pro sander polisher, includes hook & loop backing pad and hook & loop wool polishing bonnet
- 1200w motor

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• Each tile is 610x610mm & includes detachable, yellow borders

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MODEL	DISC (MM)	MOTOR	EXC.VAT	INC.VAT
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CON1050B	115	1050w	£27.99	£33.59
B&D CD115	115	710w	£29.98	£35.98
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INC. DISC & HANDLE

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Fully tested to proof load
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SE16C150	14	3	£150	£429.00
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SE26	23	5.5	£200	£679.00
SE29+1	28	2x3	£270	£969.00
SE36	30	7.5	£270	£999.00
SE37+1	36	2x4	£270	£1099.00
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INCLUDES SINGLE LOCKABLE DRAWER

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CTC600B	6 Dr chest	600x260x340	£52.99	£63.99
CTC900B	9 Dr chest	610x255x380	£64.99	£77.99
CTC500B	5 Dr cabinet	675x335x770	£119.98	£143.98
CTC800B	8 Dr chest/cab set	610x330x1070	£104.99	£125.99
CTC700B	7 Dr cabinet	610x330x875	£129.99	£149.99
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JS1900	2000w	195psi	£79.98	£95.98
JS8000	2400w	2610psi	£139.98	£167.98
JS9000	2600w	2900psi	£159.98	£191.98

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Built for tough daily use in automotive/industrial workshops
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* was £1978.80 inc.vat
Available with/without 7 pce pin, bracket & pressing plate #without kit

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CAT128	1/4" Die Grinder	£19.98	£23.98
CAT131	1/2" Impact Wrench	£59.98	£71.98
CAT132	13pc 1/2" Impact Wrench Kit	£74.99	£89.99
CAT133	3" Cut Off Tool & 1/4" Die Grinder	£47.99	£57.59
CAT134	1/2" Reversible Ratchet	£34.99	£41.99
CAT136	6" Dual Action Sander	£34.99	£41.99
CAT137	3/8" Keyless Reversible Drill	£34.99	£41.99
CAT139	150mm Air Hammer inc 4 Chisels	£19.98	£23.98

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The ultimate in tool storage!

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£143.98 INC.VAT

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BALL BEARING ROLLER DRAWERS

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CBB203B	3 Dr step up	710x315x250	£69.98	£83.98
CBB206B	6 Dr Chest	710x328x365	£99.98	£119.98
CBB209B	9 Dr Chest	710x315x420	£119.98	£143.98
CBB210B	10 Dr Chest	710x315x475	£119.98	£143.98
CBB212B	3 Dr Cabinet	755x470x810	£169.98	£203.98
CBB215B	5 Dr Cabinet	758x468x815	£199.98	£239.98
CBB218B	3 Dr Cabinet	758x418x975	£199.98	£239.98
CBB217B	7 Dr Cabinet	758x468x975	£249.98	£299.98

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329 HAND TOOLS

• This great value set includes CTC900B 9 drawer chest & CTC500B 5 drawer cabinet
• Includes the most popular sockets, spanners, pliers, drivers, wrenches etc

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Provides essential home, garage and roadside assistance
• Integral work light
• 910 includes air compressor
• Long life battery

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Words and pictures: Gary Axon

The UK's Monterey Car Week?

The pleasant English county of Hertfordshire has much to commend it. It is geographically convenient for London – hence its extortionate property prices – it boasts some fine historic towns and cities, such as St Albans, and has many green, open spaces, too much of which is filled with golf courses!

Thankfully for us petrolheads, every summer the county is also home to what I call the Herts Fortnight, a Mecca for classic and specialist car fans. Whilst not quite the Bonneville Speed Week or Monterey Car Week, the Herts Fortnight is an

unconnected series of classic car meetings, covering events large and small at Chorleywood, Stotfold, Berkhamstead, Croxley Green, the popular (almost too popular!) Harpenden Classics on the Common, and the long-established neighbouring Uxbridge Auto Show.

Every year, from late July to early August, these six Herts-based car shows attract a huge variety of classic vehicles – from clapped-out Cortinas to magnificent Maseratis – including a good selection of kit cars. Here are just a few self-build highlights from the half-a-dozen Herts Fortnight events. ■



GP Superbuggy at Berkhamstead.



Lovely Lotus Seven Series 1.



Beauford on show in Uxbridge.



Don't see many Kougar Sports these days.



Very rare Falcon Caribben roadster.



Adams Roadster was displayed in Harpenden.



AF Sports from the early 1990s.



Westfield and Caterham find harmony in Uxbridge.



This Seven is an ex-Caterham factory demonstrator.



AF Spider three-wheeler.



TD 2000 is a rare turnkey MG replica built in Malaysia in the early 2000s.



Spartan on show in Croyley Green...



...as was this Robin Hood.



Davrian Mark 5 is a serious competition car.



Mini Moke-inspired SMC Scout.

Buggies by the sea

Words and pictures: James Horsley



Beachbuggin is an annual summer show at Southsea Common near Portsmouth. Traditionally a VW based show with the beach buggy being the star, the show has grown to welcome all marques of VW and other German brands.

This year, the sun shone bright and enticed hundreds of cars and scooters onto the common, including 35 beach buggies. The array of buggies was diverse, with many different old and modern kits represented, including my own Apal buggy. A trio of UVA rails were also on display, including one that clearly meant business, powered by a water cooled Alfa engine.

Other VW kits also made an appearance, including 356 Replicas, Bajas, a rare Bonito GT40 inspired kit whilst also sitting alongside a pair

of genuine 356 Coupés. A Cobra kit was also spotted alongside a Beetle based Trike.

Being on Southsea Common, the event attracts a diverse audience, including the typical petrolhead, but also a great amount of general public enjoying a day by the sea. This year's show was larger than ever, possibly boosted by the impact of the show having to miss a year in 2014 due to an incoming hurricane! A record number of over 2700 cars attended.

The event comprises many charity and trader stalls, an autojumble and lots of family fun. It's a non-profit show with local charities benefiting from the entrance fees. If you like a day out at the seaside and a diverse array of classics, kits and VWs this is one for the diary in 2016 for sure.

www.beachbuggin.co.uk



Rare Beetle based Bonito has GT40 inspired styling.



A line-up of three UVA Fugitives.



Genuine Porsche 356 on show.



Tidy Manx buggy.

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Davrian Developments

Richard Heseltine recounts the story of one of grass roots motorsport's most successful cars, negotiating his way through the development of Mark 1 to Mark 8.

The 750 Motor Club spawned more than its fair share of legends. The 1950s and '60s in particular witnessed a seismic shift in racing car design and those doing the shifting included such alumni as Colin Chapman, Eric Broadley, Tony Southgate and Len Terry. Rather less well-known among their number was Adrian Raymond Biddiscombe Evans, a 'specials' builder who made the leap to becoming a car manufacturer via Davrian. What's more, his idiosyncratic creations would go on to dominate numerous classes in club-level motorsport, be it hillclimbs



Above: Early Davrian complete with lift-off roof.



Above: Early production Davrian undergoing testing in late '60s.

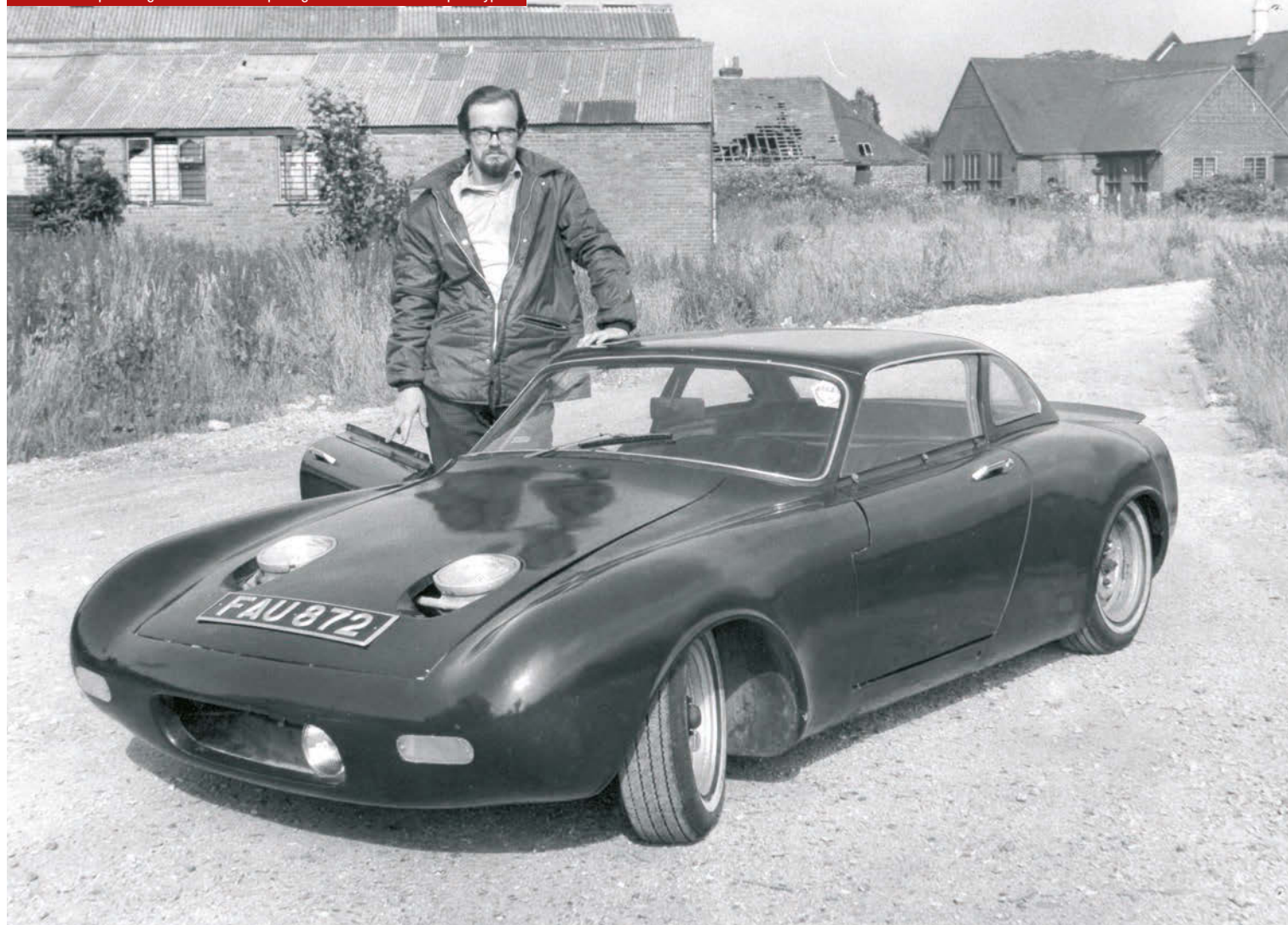
and sprints or Tarmac rallying and ModSports racing. Few cars did more with less than Davrian, a point borne out by the dozens of championships accrued by the marque in the 1970s and beyond.

Like the Walklett brothers who founded Ginetta, Evans was schooled as a structural engineer. While still in his early 20s, he created his first 750MC racer which differed greatly

from early-to-mid '60s rivals in that it had a Hillman Imp engine. Not only that, it was mounted in the *front*. This was in turn followed by another one-off machine, details of which remain sketchy, before thoughts turned to constructing a road car; something that bit more sophisticated.

That said, sophisticated is perhaps overstating things, but in 1965 to '67

Below: Marque instigator Adrian Evans posing with the first Davrian prototype.

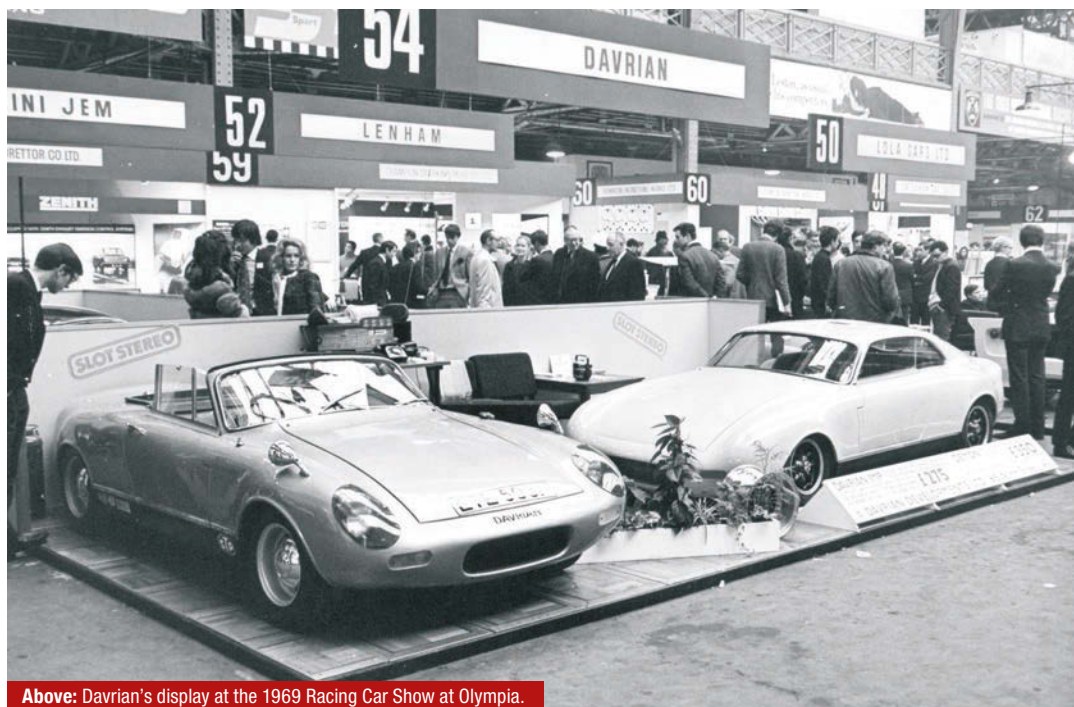


Evans created three prototypes (very) loosely inspired by sports-prototypes of the day. Each car featured Imp running gear, two with a wooden hull while the other reputedly bore a steel Imp floorpan (all future models would boast all-GRP monocoques). Initially, Evans intended to position the Imp engine ahead of the transaxle, and considerable time was invested in getting this configuration to function properly. However, the amount of work required in modifying gear linkages among other things ultimately rendered this approach impracticable for series manufacture. The first Davrian emerged blinking into the light with the Imp engine slung out back behind the rear axle line, just like in the donor car.

The initial prototype boasted a detachable hardtop while its two sisters were strictly open cars. It should be pointed out that the construction of the initial prototype was not in some immaculate and well-equipped workshop. Nope, it was constructed in the front room of his mother's semi-detached house in Grove Park, London! As for the origins of the name, Evans was assisted in the very early stages by boat builder David Clarke, a friend who was well-versed in the vagaries of making bodies from glassfibre.

The name is a contraction of his and Evans' forenames: DAV from David, RIAN from Adrian. Suitably bowed by reaction to the prototypes, Evans became a manufacturer, launching the Mark 1 in 1967 from premises on North Street, Clapham, London at a cost of £275 for a body/chassis unit complete with glazing. This particular facility would go down in motorsport history, albeit on the quiet, as it was also home at various times to racing car manufacturers/preparation concerns such as Nomad, Palliser and Gropa.

Not that success for Davrian Developments was instant. Quite



Above: Davrian's display at the 1969 Racing Car Show at Olympia.

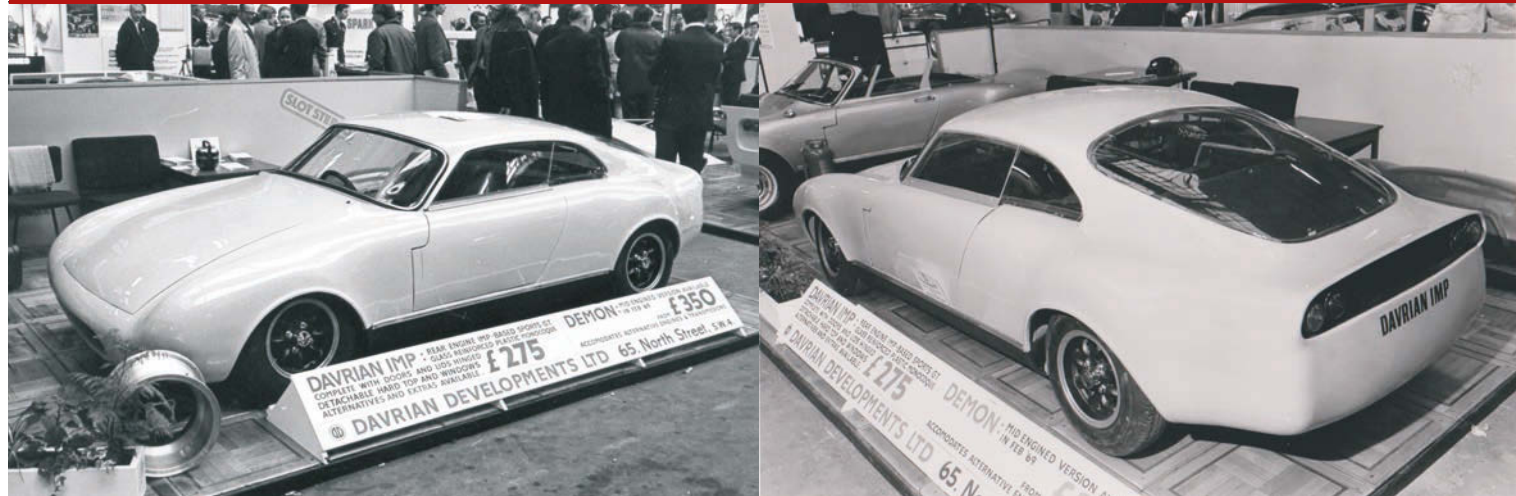
the opposite. During what might euphemistically be described as 'down time', the firm produced glassfibre panels for mainstream marques including one-piece front-ends for Minis (in time under the Davrian Glass Reinforced Plastic banner). But car production did eventually take flight, but decades down the line it's extremely difficult to differentiate between models as Davrians weren't for the most part designed so much as left to evolve. No two cars were alike even though they often *looked* similar and new models followed in rapid succession. The Mark 1, for example, looks much like a Mark 2 (or a Mark 3 for that matter).

That said, the Mark 2 was offered to punters wanting an open top car and each was sold with 'half-height' doors while the Mark 3 had a fixed roof. However, this too was quickly succeeded by the Mark 4 which made an entrance in 1969. This was the first

Davrian to feature detachable front bodywork. It was also the year that saw the firm make a determined push to raise quality and the marque displayed its wares at that year's Racing Car Show in Olympia for the first time. Except no Mark 4s were available, so a hybrid confection comprising a 1968 Mark 2 with updates was exhibited. This was retrospectively known as the Mark 2a, just to confuse future historians. And while the display was professional-looking, the car being exhibited wasn't altogether finished: for starters, it lacked front lights, wipers and door handles. PR bumf from the time also referred to the car as the Davrian Imp. That, and the Dragon. Still with us? It transpired that the Dragon tag was at that juncture intended for a new mid-engined car but, save for a pair of prototypes that were purportedly made, this scheme amounted to little.

Even Davrian itself referred to the

Below and below right: Hybrid Mark 2A foretold the Mark 4. The front end comprised reworked Berkeley panels.





Above: By definition, Davrians tended to be on the basic side.

Mark 4 by different names. On one press release from the period, it refers to it as the Imp and also the 'GT notchback edition' (the use of lower case was theirs). Regardless, the firm was starting to make a name for itself and, while no Davrian from the time could be accused of being beautifully-crafted, the dawn of the 1970s saw their credibility boosted following positive press in the specialist media. *Custom Car*, for example, raved about the demonstrator. In its April 1970 edition, it reported: "It was so incredibly taut and precise, one twitch at any of the controls and



Above: Hot Car photoshoot with a pair of Mark 5s complete with gorgeous 13in Paul Emery alloy wheels.

the car responded immediately. The road-going Davrian is what you make of it. Using bog-standard Imp gear, it will turn Spitfire/Spridget owners neurotic while retaining fully predictable and controllable manners."

Despite his intention to be a manufacturer of road cars, Evans' thoughts inevitably turned to racing and, by the late '60s, the firm began to make its presence felt trackside. *Motor Sport* magazine tested the works car for its March '70 edition, this being the car that had racked up several wins and lap records the previous year in the capable

hands of Bob Jarvis. It concluded: "...the tachometer needle indicated 7000rpm in top gear, somewhere around the 100mph mark, in a time of less than 25 seconds! ...certainly the sort of performance more normally associated with a 300bhp sporting machine."

In 1970, the Mark 5 emerged which aimed to make Davrians easier to put together for home assemblers. It retained the existing body style but the flip-forward front bodywork now incorporated a new design of pop-up headlights, while the revised rear body section detached fore of the rear wheels. It also had flush-

Below: All-alloy Imp engine powered the overwhelming majority of Davrians.



Below: New pop-up headlight arrangement arrived with the Mark 5.





Above: Mini-engined Demon was first displayed at the 1976 Racing Car Show but found few takers.



Above: Mark 8 was arguably the most resolved Davrian kit car and paved the way for the run-out Dragon model.



Above: In addition to its other activities, Davrian adapted its monocoques for Special Saloons Imp racers.

fitting Hillman Avenger door handles in place of previous Imp items. As many as 53 were sold to 1973 when it was superseded by the Mark 6. The big news here was the restyled rear end which gave the car a meatier look. Near concurrently, Davrian also introduced the Mark 6a which featured uncovered 'fold flat' headlights. But, inevitably, some regular Mark 6s also featured the same lighting treatment... The rear styling, though, was further reworked to include a lip spoiler while the rear lighting treatment foretold the Mark 7 (aka the Demon) which arrived in 1974.

The real significance of this model was the longer wheelbase and wider track. An Imp crossmember had hitherto been used to locate the rear trailing arms, but now it was bolted directly to the body/tub using specially-made brackets. Non-Imp engines could also be accommodated, not least the Mini A-series unit which Davrian had offered as an option as early as '72 but not actively promoted. One such car was campaigned with great success by Steve Roberts. It replaced his record-breaking Mini Marcos ModSports racer.

A year later, Davrian upped sticks and moved from Clapham to Wales. However, the premises in Felinfach into which Evans had planned to move the

operation failed to materialise so, for several years, production was divided between Adrian's house in Llwynygroes and a garage in Pontyfedigaid where cars were assembled.

And, just as night follows day, there were further iterations of the Mark 7, the 7a being subdivided into competition and non-race/rally, road-going versions featuring oblong Austin Allegro headlights. This styling treatment in turn hinted at the Mark 8 which was on sale from 1978-83. This is perhaps the most easily recognisable Davrian. Built from '82 in a factory provided by the Development Board for Rural Wales, it was significantly restyled with a front air dam featuring an integrated radiator duct, while the headlights now had their own moulded-in nacelles. Windscreens were bonded in, while the door handles were concealed. A variety of engines could be fitted, with Imp being the most popular followed by Ford (29 sales compared to 24). Mini and Renault units were also used.

There were, however, dark clouds looming. Davrian moved up a gear with the arrival of the new Dragon in 1981. While visually similar to the Mk8, it was intended for volume production as a complete car with mid-mounted 1.3-litre and later 1.6-litre Ford power.

Technically speaking, this model was available in kit form although this amounted to little more than a day's work installing the engine and ancillaries. Davrian was aiming for mainstream acceptance, and how. Evans was also working on an all-new model that represented a marked divergence in marque practice. Work had already started on the Sports Saloon (aka the Devil) which was intended to be a practical four-seater. Unfortunately, the firm had overstretched itself and it was liquidated in February 1983. Assets were acquired by Northern Ireland's Will Corry who engaged Tony Stevens to redesign the Mark 8. The resultant Corry Cultra was undeniably distinctive but it was a poor seller.

Ultimately, it was left to former Davrian employee and marque loyalist Tim Duffee to best capture the spirit of Evans' brainchild via the closely-related Darrian brand, but that's another story. As for Evans, he changed tack and manufactured reproduction Victorian carriages and lampposts while plotting a new sports car and utility vehicle. Sadly, he died in July 1992 before these plans were realised. If nothing else, he left behind a legacy of sweet-handling specialist sports cars that never fail to amuse before they astound. ■



Below: Davrians once owned ModSports racing. Marque stalwart Jim Adamson leading an E-type and two other Davrians aboard his Mark 7.



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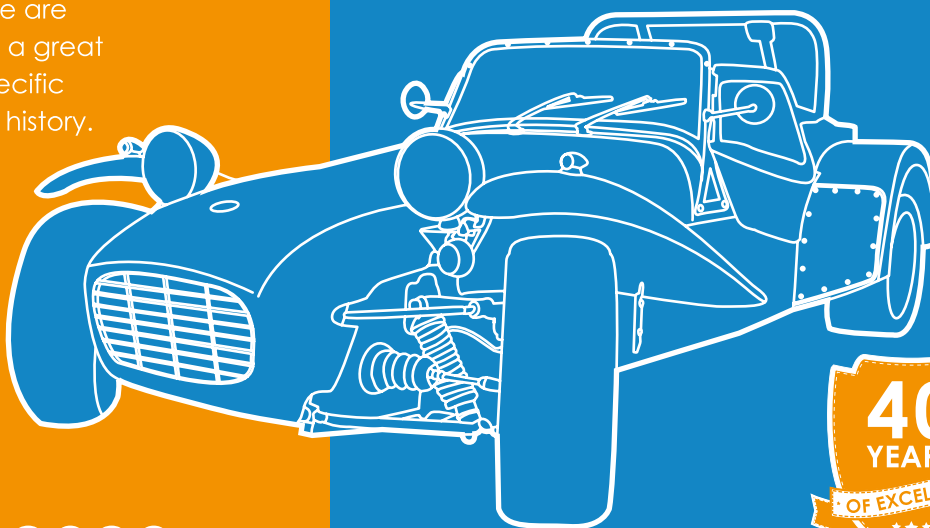
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'Charged OF THE light b

We ran the story on the build of Jim Martin's GBS Zero last month – and now here's the finished article in all its supercharged glory.

Words and pictures: Adam Wilkins



rigade

There's nothing like being spoiled for choice. We went to the Great British Sports Cars open day earlier this year with the intention of choosing a car to feature, and the pickings were rich. The standard of privately built GBS Zeros is very high these days, and there were a good half-dozen or more cars that we could have picked for a two-part reader's car story. So why did I single out Jim Martin's then recently completed car amongst the many? I think it might have been the Caterham aping decals that drew me initially – I'd just given back the 270R demonstrator to Caterham that had a very similar appearance. If it





Mazda MX-5 engine enhanced with a Jackson Racing supercharger. The result is 185bhp with more to come.



Car has the optional wide GT chassis and lowered floors. Together with the full windscreen and weather gear, it makes this GBS Zero very useable as a road car.



Useful contacts

Kit: Great British Sports Cars, Newark, Nottinghamshire. T: 01623 860990.
E: info@greatbritishsportscars.co.uk
W: www.greatbritishsportscars.co.uk

Engine management: Emerald M3D, Thetford, Norfolk. T: 01953 889110.
E: sales@emeraldm3d.co.uk
W: www.emeraldm3d.com

Various: Car Builder Solutions, Staplehurst, Kent. T: 01580 891309. E: info@carbuildersolutions.com
W: www.carbuildersolutions.com

Radiator: Coolex Heat Transfer, Nottingham. T: 0115 9423344. E: info@coolexexperts.co.uk
W: www.coolexexperts.co.uk

Weather gear: Soft Bits For Sevens, Pulborough, West Sussex. T: 01798 817560. E: juddltd@gmail.com W: www.softbitsforsevens.co.uk

was the colour scheme that drew me in, it was the forced induction that maintained my interest. The Jackson Racing supercharger poking through the bonnet is enough to keep any petrolhead's attention, surely?

When later chatting with Jim about the build, he reveals that he first considered turbocharging the car but opted for a supercharger because it was simpler and more affordable. The much more linear power delivery of a supercharger is a welcome bonus. When the car was set up on Emerald's rolling road, the 1.8-litre Mazda MX-5 engine achieved 185bhp and 156lb ft



Tech spec

Engine: Mazda MX-5 1.8-litre, Jackson Racing M45 supercharger, Emerald ECU, 185bhp and 156lb ft of torque.

Gearbox: Mazda MX-5 5-speed.

Suspension: Front – Double wishbones, Gaz coil-over dampers, Mazda uprights. Rear – Double wishbones, Gaz coil-over dampers, Mazda uprights.

Brakes: Front – Discs, EBC Greenstuff pads. Rear – Discs, EBC Greenstuff pads.

Wheels and tyres: 15in Team Dynamics Pro Race alloys, 205/50x15 Federal 595 RSR tyres all-round.

Interior: Smiths instruments, Savage switches, centre console for auxillary dials and switches, adjustable Roadster 7 seats, TRS harnesses, colour-coded Kawasaki green dashboard, Mazda MX-5 column switches, lowered floor.

Exterior: GT wide body, Kawasaki green cycle wings, Caterham style vinyl graphics, full windscreen, black windscreen frame, mirrors, grille and headlight bowls, LED headlights, Soft Bits For Sevens half hood, braced rollbar.

of torque – which is a healthy boost over the standard figures, and plenty to make the lightweight Zero more than entertaining.

When we met him, the car was very recently completed and hadn't covered that many miles and, while the suspension geometry had been set at the GBS factory, he was still keen to tweak the ride quality. It was rather firm over the bumps, and he was going to seek advice from the factory on

damper settings.

The day after the open day, many GBS owners were heading on to one of the company's track days at Blyton Park, which Jim thought might be the ideal opportunity to experiment with the settings. However, what's good for the road isn't necessarily good for the track – and vice versa. On the smooth Tarmac of the circuit, there were no issues with the ride being too hard. In fact, the car performed faultlessly in every way on

LOOK

Decals came from an online supplier and cost just £35. They're inspired by the graphics from a Caterham.





Smiths instruments and Savage switches feature in the interior.



I built this

Name: Jim Martin

Age: 48

Occupation: Director of a shopfitting company

First car: Mk1 Ford Escort

Fastest car you've been in: A 550bhp Dax Cobra replica

Favourite tool in the garage: The battery drill

Favourite thing about your car: The supercharger

its very first track day outing.

Any changes to the set-up have now been postponed until the winter, so that Jim can concentrate on using and enjoying the car during what's left of the summer and autumn. Since we saw the car, it has seen plenty of use on local jaunts, having clocked up a few hundred miles when the sun has been shining.

There are no particular plans for longer runs, although Jim's annual trip to the Stoneleigh show will be with the Zero next year. By then, the car should be producing even more power than it is now...

With the suspension set up, Jim is going to look to up the engine's power. It already has Mazda RX-8 injectors, and a few other goodies are in the pipeline.

A smaller pulley wheel – down to 62mm from 65mm – together with an intercooler are all known modifications that should see its output boosted to around 200bhp – and a planned return to Emerald's rolling road after the modifications should confirm their effect. "I'd be happy with 200bhp," says Jim. Somehow we don't think that day at Blyton Park will be its last outing on track. ■

Missed part one? The build story is in the September 2015 issue available at www.completekitcar.co.uk



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KITS I'VE OWNED

For the latest in our semi-regular Kits I've Owned feature, CKC's editor reminisces about the kit cars he's owned and run...

Words and pictures: Adam Wilkins

Imperial Jackal

A confession: quite a number of the kit cars I've 'owned' have actually been magazine staff cars. The first was an Imperial Jackal back in 2001, a car that the 19-year old me used almost daily for my 100-mile daily commute. I remember quite a lot of my money going to feed

its 2.0-litre Pinto engine, but I obviously thought it was worth it – especially as my other car at the time was a much more efficient Smart.

Notable features included mushrooms growing in the carpet and a bonnet that would often come adrift on the move.



2001

Midas Excelsior

After the Jackal, the Midas Excelsior was quite an upgrade. It was a brand new factory build specified by Peter Filby – hence his favourite yellow and blue colour scheme.

'My' first convertible coincided with a very untypically British summer, which suited the car perfectly. I remember leaving the roof off for three weeks solid, which

was popular with the local cats who used to sleep in the car overnight.

With a 1.4-litre K-series engine, it was economical and fun to drive – and I managed to clock up 9000 miles in it before it was sold. The buyer was one Alistair Courtney, who also bought Midas Cars as well as our car. To this day, it still serves as Alternative Cars' demonstrator.



2003

Ginetta G26

It's true! Despite the grief I felt obliged to give Ian about the Ginetta G26 he ran as part of our £500 Challenge, I did also run a Ginetta G26 as a staff car on *Which Kit Car?* magazine.

Like the Jackal and Midas before it, I pressed the Ginetta into daily service. I ran it during the winter of 2003 into 2004, and my memories of it are as gloomy as the weather.

An example: driving it one wet night with a failed alternator, the dropping power in the battery



2003

was evidenced in the headlights dimming and slowly retracting back into the bonnet.

Still, it's better than driving something boring, and it provided plenty of memories along the way. I wonder where it is now?



T&J Hornet

Here's the first kit car that I actually bought with my own money – but I never drove it. Instead, it was bought as a light restoration project, and I did a little bit of work on it before selling it on.

It was basically OK when I bought it, so it just received a cosmetic freshen-up before going on to its next owner. Along with the Ginetta above, it's one of only two kit cars I've owned that I've never seen again after it went.



2004

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adam@performancepublishing.co.uk

Tiger Avon

If you ever have the chance to go racing, do it. Back in 2005, my dad, my uncle and I built a Tiger Avon racer to enter into the Tiger single-make championship. We ran it for five seasons and

it remains one of the very best things I've ever done. Track days are great (and arguably far better value than racing... but that's a whole different conversation), but they don't compare with barreling



2005

Enzo 430

I didn't actually ever own the Enzo 430 replica that Stent and I built at the Enzo factory six years ago, but I did own the Toyota MR2 that went underneath it. It had been my daily driver right up until the morning we started removing the panels from it.

I went home on the train that night, and have been using one of two Mondeos as a daily ever since. I still often wonder why.

2009



into the first corner of a race knowing that everyone wants the same piece of Tarmac.

The car was built to a strict budget, and we did each season probably as cheaply as it's possible to do – but in the end, it was spiralling costs that led us to call it a day at the end of the 2009 season. It was a difficult decision to make, and I still refuse to say that I've given up racing – I'm just on a prolonged break, which was broken by a single race in a different car in 2012.

Sentimental attachment means I still have the car, but after six years I'm finally beginning to face the realisation that I'll probably never race it again.



2004

Quantum 2+2

The Quantum 2+2 was another *Which Kit Car?* staff car, and one that saw almost as much use as the Midas. I always thought that the colour and wheel choice was brilliant, and emphasised the Quantum's ability to blend in with mainstream traffic.

That's something that not many kit car manufacturers want to do these days – the whole point now is to offer something that you *can't* get in a high street showroom. But the 2+2 was truly a car that had production cars in its sights, and pulled

it off. Shutlines were good, it was easy to live with and the interior, with its stock Ford Fiesta dashboard and seats, was utterly familiar.

When my time with the car was up, it was bought by someone from Scotland, who came down to the *Which Kit Car?* office in Surrey and drove it back to north of the border. It was that kind of car – you could just get in and drive it anywhere.

It appeared on eBay last year, still in Scotland and owned by the same person who had bought it a decade earlier.



Spartan Treka

This is probably the car that needs least introduction. It was my entry in the *Complete Kit Car* £500 Challenge and, while it was beaten by Stent's Ginetta G26 in the final reckoning, I will always consider it by far the better car. Well, van.

Its reliability issues were well documented at the time (in this photo, I'd just been towed off a busy roundabout by the Highways Agency), but when it worked, it worked well. I regularly clocked up several hundred miles a week without issue, and it drew (surprisingly) positive comments wherever it went.

And the good news is that it's in safe hands. Current owner Alex Prior has been systematically improving the car since he bought it. He even managed to achieve what I always wanted to, but never did, by bringing it to the CKC/Omex track day at Llandow last year. It's a brilliant car, and I won't hear it be said otherwise.



2008

Sylva Riot

At precisely the time I was considering a replacement for my Lotus Elise, Stent brought Sylva's first car-engined Riot demonstrator to our *Which Kit Car?* of the Year shootout in 2005. Having already test-driven, and decided against, a CC Cylone, modified MG Midget and 'Frogeye' Sprite, the Riot was suddenly the choice to replace the Lotus – a car I'd overlooked simply because I didn't much like the styling.

I still slightly regret not buying the Cyclone, but I've never regretted choosing the Riot. The epiphany was on day three of the car of the year outing, when I'd had an absolute blast chasing Stent, who was at the wheel of the much more powerful Aeon

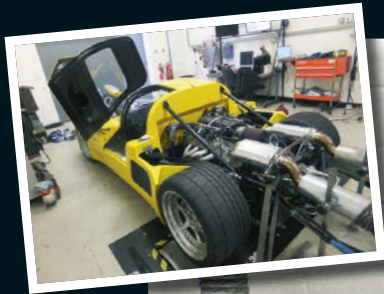
GT3. It was one of those drives which makes you feel alive. It was about a year later that I ordered the kit, and it was on the road in 2008. It still gives me the same buzz I got in 2005, and I even quite like the look of it now!

2008



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Velvet glove

To celebrate its 25th anniversary, Gardner Douglas did more than make a cake – it developed the Mk3R, and retro-fitted the package to its long-serving demo.

Words and pictures: Adam Wilkins

IRON FIST





It would seem slightly strange to use the word 'subtle' when the subject is the 410bhp Gardner Douglas 427 Mk3R. The thumping Chevrolet LS3 engine and muscular Cobra replica styling ensure that it is anything but. Yet the R upgrade package, which marks 25 years of Gardner Douglas, *is* rather subtle. Boss Andy Burrows has no intention of replicating the over-wrought American-style interpretation of a Cobra, instead preferring to retain the British sports car lines that begat the whole genre. "I don't buy into what the Americans have done with the Cobra," says Andy. "The tall bodies and big balloon tyres make them look half a tonne heavier – they just look slow, more like a boulevard cruiser." There are no such reservations about adding big American cubic capacity, however.

The things that make this a Mk3R rather than a Mk3 are the increase in wheel diameter front and rear, and a sympathetic remodelling of the arches that house them. And that *has* been done rather subtly. For two and a half decades, that has been the GD way of doing things – never too shouty but always able to let the cars' performance do all the talking.

Gardner Douglas has been careful to ensure that the package can be retro-fitted to existing Mk3s. The new arches require bonding in place, to make way for the larger wheels. The theory is that the rear wheels can move to the front, meaning that those upgrading an existing car only need to buy one pair of wheels for the rear. There are no changes necessary to any suspension components or geometry. Even so, GD's advice is to keep the tyre size on the sensible side – its own demonstrator has 235/40x17 tyres at the front and 275/40x17 at the rear. Wider rubber causes its own problems on lightweight sports cars; you need to ensure that the weight isn't spread over too wide a contact patch, as that can actually reduce grip and traction. The demonstrator isn't lacking in presence, but it does so without resorting to comedy wide tyres.

This car is actually GD's hard-worked, 15-year old demo. It was originally built with a classic look to appear at the NEC classic car show, and painted silver to match a Chesil Speester with which it shared a stand. Over the years, it has been gradually upgraded and changed. It started out life with a 350cu in iron block Chevy V8 engine before being changed to an LS1 in 2003. That engine had been ported by another company – but not very well. "It turned into a steam engine, with more water coming out of the exhaust than anything else," says Andy. In went a stock LS2 that has served the car reliably ever since.

Other changes over that time? The fan style wheels it originally had were swapped for Halibrands some years ago, and the hard-top was fitted during the most recent update. Those developments are just the sort of thing a private owner might do with their own car and sum up just one aspect of kit car ownership.

One thing that GD's Andy Burrows updated very reluctantly was the paintwork. "I liked it with the stonechips, because it looked like a used car," he says. "But it wasn't ideal for shows in that condition. Still, it will get some more when it's done a few track days." The new colour scheme was deliberated over, and in the end a slightly darker silver was chosen with painted stripes that echo the vinyl that was there previously. The colours are inspired by the British flag, but not obvious as a straightforward red, white and blue configuration. If 15 years worth of wear have been eradicated from the exterior, the car's history survives in the patina of the interior, which still has all the original trim. "People ask me if they can have the same material for their own cars, and I just have to tell them to use their car for 15 years," says Andy.

It's certainly an inviting cabin. A Cobra replica with a hard-top has a surprisingly different character to one without. GD's policy of showing as many differences between its Mk3 and Mk4 demonstrators means that the roof is almost permanently in place and, with some dark clouds circling as I left the factory gates, I thought that it's something I might be thankful for later. As it turned out, the roads stayed dry – which is a good thing when you have 400bhp-odd to manage through a set of semi-slick Toyo R888 tyres.

Actually, as is so often the case with LS engines, the sheer amount of power is disguised behind a façade of civility. It idles obediently, and then delivers its power in a perfectly linear fashion. If that makes it sound unexciting, don't worry. Push the throttle deep into the footwell and the car will still tear your face off. There's no way that 410bhp in a 1000kg car can be anything other than devastatingly quick. And what a noise it makes while you're at it – a deep roar with an over-riding urgency. That's the other thing about LS engines: despite their size, they like to rev. And the speedometer's needle is almost as quick through its own sweep as the rev-counter's.

It isn't merely a blunt instrument of power. OK, you may need to be deliberate with your inputs (a freshly fitted steering rack in particular could have done with a few hundred miles of bedding in – I made as much of a start on that as I could!), but the GD 427 has always been known for its talents in the corners. Turn-in is keen, and



Chevrolet LS2 is this car's third engine. In its standard form, it produces about 410bhp and can return an incredible 32mpg! Subtly flared wheelarches are a visual clue to Mk3R.

“Despite their size, LS engines like to rev – what’s more the speedometer’s needle is almost as quick through its own sweep as the rev-counter’s”

feedback through the wheel is never anything less than communicative. There’s a good mix of big, sweeping corners and tight switchbacks close to GD’s rural Nottinghamshire works, and for some time I appeared to have them to myself. Not once did the car feel unprepared for what the road had to throw at it. It doesn’t take long before you’re attacking the road in the way you would with a lithe Seven-inspired roadster, despite carrying a little more weight and using a lot more power. It belies its heavy track miles, too; there

are no squeaks or rattles to give away the hard use its had.

And when you want to take it a little easier? You can leave it in a high gear and surf along on a generous wave of torque. Even at low revs, you can enjoy a rich soundtrack, rendered subtle (no apologies for using that word again) by the underslung exhausts that deliver all the noise behind you. Sidepipes are available, but the rear-exiting ones have always been popular amongst Gardner Douglas customers. They’re good for

Gardner Douglas: a potted 25-year history

Gardner Douglas’s Andy Burrows made his first professional appearance at the Stoneleigh show in the mid-1980s, several years before he became a kit car manufacturer. He was there with the NG TC V8 he had built, and was offering his services as a kit car builder. Back then, that wasn’t allowed – you either had to be a manufacturer or an amateur builder. “I got a telling off from the late Jem Marsh,” says Andy, “who told me what I was doing was illegal. We had a laugh about it decades later, when he came to buy some uprights for a Marcos he was developing.”

When Andy came to build his first Cobra replica in the mid ’80s, he was offered an abandoned project that had a very basic ladder chassis and Cortina suspension. He’d also found a early ’70s Toyota hemi V8 and thought it would make

an interesting change from the usual Rover V8s of the time. Says Andy: “I realised the car would still be a shed underneath, so I had a rethink and started designing my own chassis, penning the final Jaguar donor based design in 1986.” After building a few one-off cars, Andy approached Roger Woolley of RW Kitcars, then maker of cars like the VW based Karma, to produce a set of production moulds. Roger and Andy then collaborated for a year or so with his first production Cobra kit sold under the RW banner. “I had no intention of making it a permanent thing at first, I just wanted to build the chassis and do the engineering, but I soon realised it deserved more commitment.”

In 1990, Gardner Douglas was launched. Andy worked from home, and sourced bodies from RW until moving the company into its first industrial unit in 1995. For a year, everything was made in-house, until GD moved to its current home in 1996. The unit was a bare shell, so for three years three different contractors were used to make bodies. “That was three different mistakes,” says Andy, who brought everything back in-house in the late 1990s.

By then, the company had really hit its stride. The big news was the introduction of the Euro chassis in 1994. By now there were increasing sales in Europe,



where servicing ageing Jaguar parts isn’t easy. By using Ford bearings and other consumables in its own uprights, GDs could be serviced throughout Europe. “I called it Euro because I couldn’t think of a better name at the time, and it just stuck,” says Andy.

Gardner Douglas is known for its motorsport pedigree. “We went racing for two reasons – for our peace of mind so that we knew the extent to which we could abuse the car, and also to show what a standard road car could do.” The answers to those questions were definitive: it set five lap records in two years, and ran the same set of uprights from 1994 to 2001 – and only had one change of wheel bearings in that time. “We got into it because it was fun,” says Andy, “but it’s incredible how much time it takes up. Not only the race weekends themselves, but preparation time and occasional testing, too. In the end, we decided that you’re either a full-time motorsport team, or you just do the odd race when you can.” By the early 2000s, road car sales were at their





LOOK

Gardner Douglas now offers two hard-top options for both its Mk3 and Mk4 427s. Gives the car a whole different appearance.



peak. "I remember open days where we'd sell 13 kits at one, 10 at the next and nine at the one after that," says Andy. "Our busiest year was 43 kits, which put the moulds under pressure. When you're doing almost one body per week, you don't have time to service the mould." It was around this time that the Mk4 body shape was introduced, which meant that the workload could be shared between two sets of tooling.

Something else that had come from GD's motorsport activities was the T70. Fellow racer Bob Usher-Sparks had bought a crashed T70 replica racer, which came with a set of body moulds. He liked Gardner Douglas's engineering, and approached the company to help rebuild it. A plan was hatched to make a new body using the existing tooling with an all-new chassis underneath.

Sadly, before the car was complete Bob had to retire from racing due to ill health. Since Gardner Douglas was already advanced with the work, they bought him out of the project and continued with it. At



this stage, changes were made to its specification – it would be a road car with two seats, SVA (now IVA) compatibility and enough suspension travel for road use. Once complete, the Gardner Douglas T70 competed for a full season before it was even released to market, making its debut at the 2001 Donington kit car show.

There have, of course, been other diversions along the way – some will remember the MSE and GT concepts of the late 1990s, and evidence of both are obvious at the factory. That's a story we may well return to in the future. Says Andy: "It's a very rewarding business – seeing things going from a steel rack and a bucket of resin and turning them out as cars. Some of our customers are multi-millionaires, but they still prefer to drive their GDs despite owning all sorts of other cars. They also really love dealing with a small company." There are no shortcuts to earning a reputation like GD's.

track days, too; unlike sidepipes, they don't fire their noise straight towards trackside noise meters.

Andy says that, cruising in this manner, he's seen the LS3 return 32mpg. That's incredible given the amount of performance and power on tap.

We mentioned earlier the GD 427 Mk4. For the avoidance of confusion, the Mk3 and Mk4 name tags relate to the cars' body shapes, rather than a mark progression in the traditional sense. GD's first model was designated Mk3 because its shape was close to that of AC's Mk3 – a silhouette that Andy chose simply through personal preference. Despite the GD's 427 name, the original Mk3 was actually a 289, but less recognisably so as the Mk1 and Mk2 had the 'slab side' styling we more readily associate with the smaller cubic capacity cars.

The Mk4 was added to the stable when Andy bought the moulds from AC that had been taken from an aluminium Superblower to produce the Carbon Road Series. The differences in shape are quite obvious when the cars are parked next to each other, and Gardner Douglas always keeps a demonstrator of each so that

Tech spec

Engine as tested: Chevrolet LS2 V8 in standard tune, producing 410bhp.

Engine options: Pretty much all conventional V8 engine options can be accommodated.

Chassis: Ladder chassis with semi-monocoque composite body.

Bodywork: See above.

Suspension: Front – Double wishbones, alloy uprights, coil-over dampers. Rear – Double wishbones, alloy uprights, coil-over dampers.

Steering: Rack and column.

Brakes: Vented discs all-round.

Kit price: Rolling chassis £8650 plus VAT.

Contact: Gardner Douglas Sports Cars, Unit 26B Roseland Business Park, Long Bennington, Newark, Nottinghamshire NG23 5FF.
T: 01949 843299. E: sales@gdcars.com
W: www.gdcars.com



Interior trim hasn't been replaced as part of the demonstrator's R makeover.

customers can try both for size. They feel surprisingly different, with their variations in scuttle heights and cockpit sizes. The R-spec additions to the Mk3 have given it a more aggressive look, closer to that of the Mk4. Where the Mk4 is wider than a standard Mk3, the Mk3R is the widest Cobra replica in the stable.

As a general trend, Andy has noticed that recent customers have tended towards a more classic, racecar appearance for the cars. Perhaps that's because of the increasing popularity of events like the Goodwood Revival, where original cars are seen racing

in their authentic colour schemes – which doesn't always have to be blue with Shelby stripes. The company has exhibited at Goodwood in recent years, too, putting its cars in front of that very specific audience. "We're not replicating the historic cars, though, so we don't get too hung up on originality," says Andy.

The GD chassis is a backbone spaceframe with two variants for either donor Jaguar axles or GD's purpose designed suspension in the Euro. Both chassis fit either the Mk3 or Mk4 monocoque body. GD lists everything required to build either variant on a spreadsheet, leaving no surprises for customers after they've bought their starter package. A chassis kit at starts at £2565 plus VAT, and then builders

continue buying parts as and when required, or group logical items together in packages suggested by GD. Either way, by the time you have bought everything including trim, wheels and tyres, roll bars etc but excluding your chosen power unit the tally comes to... £20,421.52 for a Mk3 with the Jaguar based chassis or £21,454.90 for a Mk4 with the Jaguar based chassis. The Euro chassis cars are £25,246.02 for a Mk3 or £26,570.40 for a Mk4.

Other options available like Mk3/Mk4 hardtops start at £2000 or from £3000 factory fitted. The Mk3R arch kit adds around £1500 and would typically be factory fitted to ensure body integrity.

The cost to build a car like the demonstrator, but in gelcoat and with a new current LS3 and a Jaguar based chassis, would be around £32,000 plus VAT. Adding the Euro option, track rubber, big AP brakes and hard top as per the demo would push the cost over £45,000. Alternatively, factory built cars start from around £49,000 plus VAT. For the engineering prowess that Gardner Douglas is known for, that sounds like excellent value.

After 25 years, the appeal of the Cobra replica hasn't waned at all. If anything, the appeal of a modern-day offering such as this is bigger than ever – and that's backed up by a healthy order book. When the product is this good, you can afford to be subtle about it. ■



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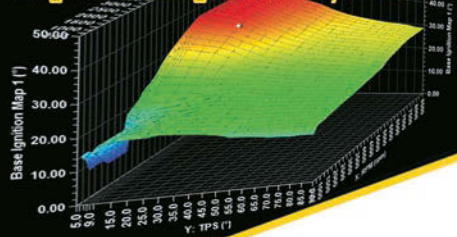
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TOP 10... WOODEN KIT CARS

Not all kit cars are made of steel, aluminium or fibreglass... some are made of wood! Yes, really. Here we choose our top 10 wooden kit cars and specials.

Words: Ian Stent
Pictures: CKC archives

Cerberus

In reality, the Cerberus only just qualifies for this piece, since it wasn't actually the finished car, just the prototype buck from

which conventional fibreglass panels could be created. But we had to include it simply because of the ambition of its creator,



Pete Stone. Featured in CKC back in our November 2013 issue, Pete's Audi V8 engined supercar concept blew us away. Since then, work on the car has continued, along with Pete using his metal fabrication skills within the Lamborghini Replica Club, of which he's an active member.

DRK

The Renault based DRK is a high quality three-wheeler which uses a hardwood frame on which layers of plywood were then covered in an aluminium outer skin. The styling is simple and effective. Around 60 cars were sold between 1984 and 1998.

AF Spider



Marine plywood formed much of the external structure of the AF Spider, with a hardwood chassis underneath. This was supplemented with a fabricated steel subframe for the Mini engine and box up front and a small sub structure at the back on which to locate the rear swing arm and single wheel. Created by Alexander Fraser in 1969, his aim was to build a practical everyday mode of transport. As such, the first car had a generous fuel tank and even a tow hitch. In the mid '70s he launched the Grand Prix version, and in total around seven Spiders and five Grand Prix were built.

Topher's trike

A one-off, but worthy of inclusion here. Topher Dawson built this bonkers creation as a more practical answer to his daily commute! Based on a replacement Citroen chassis, he converted it to a three-wheel layout and then created the

clinker-style plywood body which is located onto a strong steel subframe. Inside there's a dash made from elm and mahogany door cappings. Behind the front seats is a storage area which is most easily accessed via the hatch in the roof. Brilliant.



Burlington

The Burlington Motor Company, brainchild of one Haydn Davies, created a number of products during the early 1980s that were supplied as basic paper plans, for the private enthusiast to then create from scratch. Often using a Triumph sourced chassis, 1930s style bodywork was then created in plywood and usually skinned in aluminium (as shown above with the Burlington J-Type). With its painted finish the Burlington products kept their wood origins firmly under wraps.

Midge et al

John Cowperthwaite has been one of the largest exponents of using wood to construct vehicles of one type or another. All based on the cost-effective starting point of paper plans, it was then up to the builder to cut, glue and screw the main structures together, before then invariably covering the exterior in thin aluminium.

The traditional roadster styling of his first car, the JC Midge of 1985, proved very popular and we've seen some immaculate examples. The Lotus Seven inspired Locust first appeared in 1988 and was another hit. And then there was the Jeep influenced Husky, produced in MDF under the Real life Toys banner from 1991.



Kelly Trike

Wooden cars don't have to be angular and basic, as proved so perfectly by Peter Kelly's one-off trike. Featured in CKC in our December 2013/January 2014 issues, Pete's trike is utterly stunning. Despite having never used the material before, he used Parana pine to create the curvy bodywork, with seemingly endless thin strips of the material painstakingly glued together to eventually form the complete bodywork, into which he then had to cut out the doors and bonnet.



Marcos Xylon

More commonly known as the 'Ugly Duckling', the 1960 Xylon was designed by Frank Costin and created and marketed by Marcos. Highly effective in racing, the Xylon used a plywood monocoque, of which the outer panels also formed part of the bodywork. Powered by an 1172cc Ford side valve engine, the Xylon was highly successfully campaigned not just by Jem Marsh but also Jackie Stewart among others. If ever there was a successful wooden car, this was it! Although the bodywork of later Marcos models were created in fibreglass, the company continued with wooden chassis construction until around 1969.

Hustler

Although not originally a wooden car when launched in 1979, if ever there was a car so perfectly designed to embrace the material, the William Towns designed Hustler has to be it. A marine ply monocoque was supplied from the factory and onto this the customer could create the remaining bodywork using plans supplied by the factory. What's more, he could even choose between four or six wheels for his Mini based creation!

Tryane

Friend Wood (yes, really) is the chap who built this, the Tryane. Assembled with mahogany veneer, the car first appeared back in 1989 and was then revamped into Tryane II, which caused headlines again in 2007. Perhaps obviously, it was never offered as a kit and was always a one-off special. Friend went on to build a recumbent bicycle also fully enclosed in a

beautiful wooden outer shell. Clever chap.



1





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A break with **TRADITION**



It may look like a traditional roadster, but its BMW M3 basis makes the Marlin Sportster an altogether different animal – on road and track.

Words: Adam Wilkins

Pictures: John Mountney

There's a constant desire to pigeonhole, categorise and classify. Without knowing the place of something, we lose the ability to compare it against its peers and rivals, making it hard to judge its merits. The Marlin Sportster rather sits in a class of one. It's not a traditional roadster in the sense of, say, a JBA Falcon or even a Marlin Cabrio, yet neither is it a lightweight tearaway, the like of which is common in the kit car market. With its big engine and cycle wings, the closest comparison is probably the NG TC V8 – but that's no longer in production. While the Sportster isn't a new car – it was launched in 1998, and moved to its current BMW 3-series basis in 2000 – this is actually the first time I've driven one. And with nothing to gauge it against, I'll have to approach it with as open a mind as possible.

The scene is the paddock at Castle Combe, and the first time I ever turn right in it will be through the foreboding Quarry corner. This is about as far removed from the wicker picnic basket world of traditional touring as it's possible to be. The same can be said of the M3 sourced 3.2-litre six-pot under the long bonnet, which is sending 340bhp to the back wheels. Game on.

The main focus of the day is a test session for Marlin's sister company, Avatar Sports Cars, and its One racing car. Former *Top Gear* Stig Ben Collins is on hand to assist with the development of the racer, and in between his hot laps, when he has the track to himself, a number of Marlin owners are taking to the track in their own cars.

While Castle Combe may be one of the fastest circuits in the UK, there's nothing intimidating about your first





Marlin Sportster has the demeanour of a grown-up Caterham Seven. Bigger, more comfortable but still fun to chuck around.



appointment with the Sportster. Hopping over the sills is easy thanks to a shallow door and the cabin layout does indeed feel like that of a traditional tourer. There's plenty of space around you, the seats are generously padded and an upright windscreen hosts three windscreen wipers.

There are visual clues to the potent M-power unit that lurks under the long, louvred bonnet that stretches out in front of you, though. A carbon fibre effect dashboard, brake bias lever and Racelogic box aren't the typical accoutrements of a car that looks like it was styled in the 1930s. The big wheels and tyres are the biggest giveaways outside the car. Twist the key and the six-cylinder engine's smooth idle sets the tone.

For all its size and comfort, when you start to hustle the Sportster it feels as though it shrinks around you. Its nimbleness is quite at odds with your expectation. When you're going quickly, you steer it from your elbows, but turn-in is precise and it's phenomenally well balanced in the corners. Thanks no doubt to its relatively long wheelbase, you can chuck it into corners with increasing vigour and it just takes it without drama.



On my second session, once I'd learnt which way the track goes, I even found myself trying to unslick the rear end on the way to the apex of Quarry. Push beyond its limit, and the Sportster's benign character really starts to endear.

There's travel in the suspension that you can lean on to give you plenty of forewarning about any oversteer, giving you plenty of time to correct the slide. It's laugh-out-loud entertaining, which is all the more amusing given its stiff-upper-lip appearance.

Castle Combe's two chicanes give you a chance to lean on a car's brakes, and the stopping power from the Wilwood four-pots means you can dare yourself to extend the braking point deep into the corner. And through the second-gear corners that follow, the Sportster feels like a much smaller car. And, of course, it's not lacking in accelerative urge on the way back out of the slow corners.

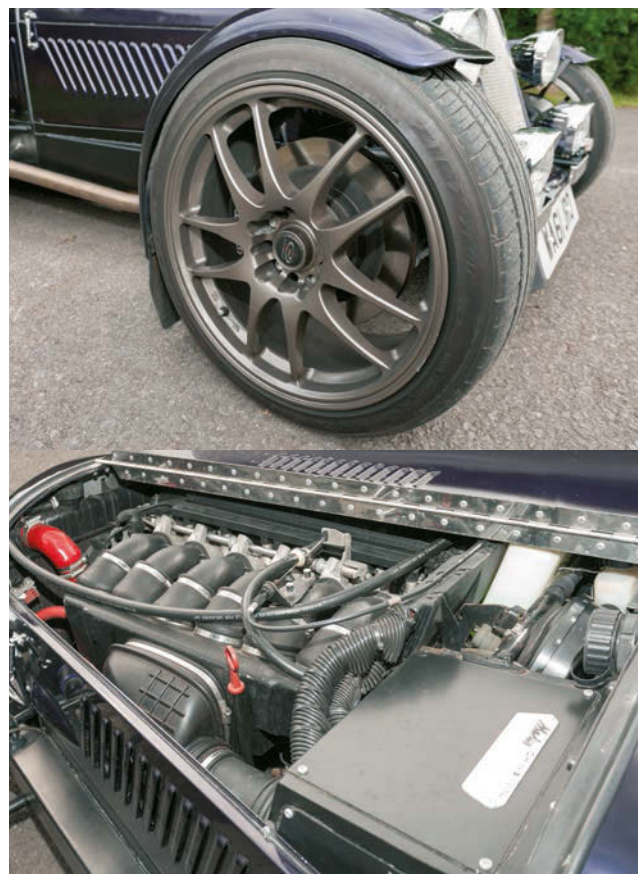
Marlin's Terry Matthews is keen that I try the car on the road as well as the track, so I head out of Castle Combe's gates and into the Wiltshire countryside. I head straight to the main roads, but they're jammed and I try to use an alternative route back to the circuit.

I have a theory that if I overshoot the usual turning to Combe, I can keep turning right and make a big square back to the track. The theory works, but not until I've spent a considerable time touring numerous Cotswold villages.

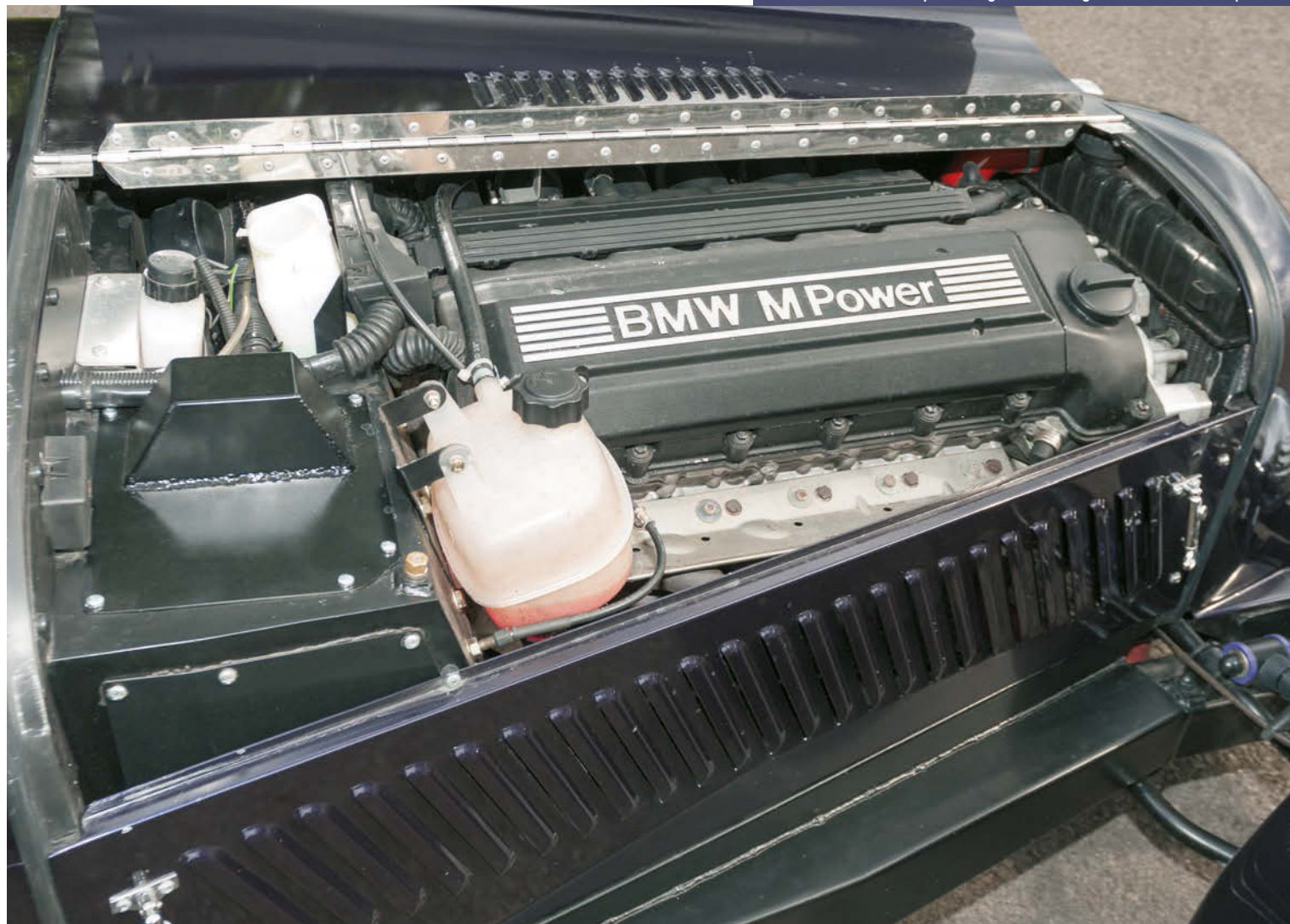
The car is perfect for the job. You rarely *have* to change gear, instead letting the big six-pot pull the 800kg roadster along at low revs. It makes a great noise, it rides well and you just sit back and enjoy it. Maybe the Sportster has got the wicker picnic basket thing down, too. So as well as being a bit of a brute on track, there's another, more laid back side to the Sportster's character.

If you need to get past slower moving traffic, you can maximise even the smallest overtaking opportunities to do so, which must be somewhat surprising to onlookers.

In terms of the car's spec, we've only so far established its BMW M3 engine. You don't have to go to that extreme: any E36/E46 generation 3-series or E39 5-series can be used as a donor (with the exception of the V8 M5), giving you a range of four and six-cylinder engines to choose from. And, yes, that even includes diesel. At the



BMW M3-sourced six-cylinder engine makes a great noise and 321bhp.



Tech spec

Engine as tested: BMW M3 straight six producing 340bhp.

Engine options: Any E36 or E46 BMW 3-series or E39 5-series (except M5 V8).

Chassis: Steel semi-monocoque peripheral frame, galvanised steel floors.

Bodywork: Aluminium doors and bonnet, GRP wings and nosecone.

Suspension: Front – Double wishbones, adjustable coil-over dampers, BMW stub axles and hubs. Rear – BMW subframe with multi-link IRS, BMW springs and dampers.

Steering: Rack and column.

Brakes: Discs all-round.

Kit price: From £3900 plus VAT.

Contact: Marlin Sports Cars, PO Box 88, Crediton, Devon EX17 3WZ.
T: 01363 773772.

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rear, the BMW subframe is used complete with the IRS multi-link suspension. The donor is less relied upon at the front, giving over its stub axles and hubs to be used with coil-over dampers and fabricated double wishbones.

The main structure is a steel semi-monocoque peripheral frame with steel

floors, clothed in a body that is a mix of aluminium and GRP.

Kit prices begin from £3900 plus VAT, with self-builds starting from around £10,000. You'd need to spend a little more to match the M3 spec of the demonstrator, with a self-build cost of about £35,000. Factory built Sportsters start from

£20,000, rising depending on specification.

Terry comments that part of the intent with the Sportster was to offer similar thrills to those of a Lotus Seven inspired sports car in a more mature package – one that has a little more space and comfort. If you're looking for a pigeonhole, that's accurate and succinct. ■



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Your Letters

Got something you need to share with the kit car world? Need to let off steam about the kit car scene? Here's your chance to have your say – email us, and spread the word via this page.



Caterham query

In issue 84, you had a road test of the Caterham 160. I have not come across much in print since. I wonder if you have any idea how many have been sold and whether any problems have emerged.

Any information would be most welcome.

George Moore, Lincolnshire

We don't have any sales figures to hand, but we do know that the 160 has proved very popular in Japan, where it falls within a favourable tax bracket. As far as we know, Caterham's Japanese distributor is taking almost as many 160s as the factory can make – Ed.



SEND US YOURS

Tell us your thoughts on all things kit car related. Email adam@performancepublishing.co.uk

Are cars only for driving?

Everybody has the right to decorate his car as he likes, but in my opinion, it has to remain drivable. You wrote a poetic article about an eccentric Autotune Aristocat but I don't think that car would pass the MoT again as it is now (it certainly wouldn't in Belgium). Cars, and especially nice old ones, are made to be driven and to run around, not to become an impractical piece of 'conceptual art' or something like that. If it is true that the owner thinks he has reduced the market to one such car, it is also true that he wasted it as a drivable car.

I find it rather unsurprising that would-be buyers would like to restore that beautiful car to its former glory. People are not all obsessed with shiny paint and many old-timers are kept in their

original paint and original interior with patina but they don't put all sorts of junk on their car, they drive it and enjoy it....

Antoine Ryckman, Belgium

Lotus 2CV?

I love the idea of old cars made modern underneath. Lots of kit cars have footprints similar to old classics – it doesn't have to be old kit cars. I reckon the Banks Europa would fit perfectly under a 2CV body. Now that would be hilarious.

John Birrell, CKC Facebook page

Not a...

This may make you chuckle. Your question, "To badge or not?" (issue 105), please see the attached photos of my new bike (it's all in the smallprint!)

Martin Scott, contributor



Letter of the month

Letter of the month wins its writer a top quality CKC fleece

No fun on your own?

I absolutely love the Rayvolution Evo (September 2015, issue 105) and did consider doing one. But only one seat makes it hard to have fun on your own.

Alistair Rutledge, CKC Facebook page



Meanwhile, on Facebook...

We asked you what donor you'd put under a new CHAD SS4....



Lexus LS400/430
Christopher Williams

Looks like a Nissan 300ZX would be a good fit.
Anthony Cherry

Mazda MX-5 and BMW are becoming such common donors these days that the prices are sure to increase soon. I'd look for something a bit different – VW/ Audi if front-wheel-drive will fit the design, or Mercedes if it needs rear-wheel-drive. Lots of engine choice in either. Maybe even Subaru Forester and get 4wd.
Tony Vincent

BMW E90.
Rob Tolley

Supercharged Honda Civic Type R.
Ryan Suchecki

BMW 3-series. Plentiful and cheap.
Italo Sciacca

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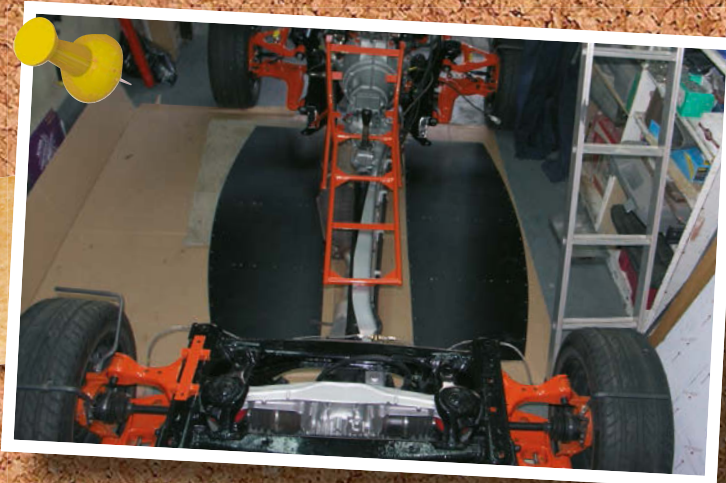
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MEV Exocets

Having collected their kits in the same van, Chris Stagg and John Gilbert built their MEV Exocets simultaneously. Their builds had similar goals but very individual results, as Adam Wilkins discovered.



By the time Chris Stagg and John Gilbert were ready to collect their MEV Exocet kits, they already knew each other quite well – despite the fact that they hadn't actually met. Both had already sourced and stripped their Mazda MX-5 donors and had communicated via the MEV builders' forum. Because Chris would virtually have to drive past John's door on his way to picking up the kit, they decided to share the cost of the van hire and go together. From then on, their builds ran in parallel and were completed just a

month apart. Throughout this feature, Chris's build is shown on the top row of photos and John's is on the bottom row.

For John, who had built a Nova back in the 1980s, the most stark contrast between kit car building back then and today was the online support available. "If you got stuck on something back then, you had to work it out for yourself. Now you can go online and find someone who has had the same problem and see how they solved it." The other difference was that this time he had help: the car was built as a father-and-son project with Luke, who

has just starting having driving lessons as the car was complete.

Having started at exactly the same time, back in March 2013, their builds more or less ran in parallel and they had similar ideas on how to modify the basic Exocet package. "Quite often, Chris would post on the forum his latest mod and I'd think 'that's just what I was going to do!'" says John. Perhaps this is partly down to the fact they discussed their plans in the van on the way to collect their kits.

Both collected their chassis in bare, unpowdercoated form as they both

Below: The donor car strip-down begins.



Below: John and Chris's chassis loaded up together.



Below: Wishbones modified in a similar fashion to Chris's.





Above: Donor was a base model UK spec Mazda MX-5.



Above: Body lifted away from one-piece mechanicals.



Above: Bodysell cut in half to be taken away as scrap.



Above: Both Chris and John ordered their chassis without powdercoat so that they could modify them prior to having them treated.



Above: Extra metal welded onto MX-5 wishbones so they...



Above: ...don't need edge trimming to meet IVA regulations.

planned to weld in additional brackets and chassis members. Before any of that, though, Chris sent away the rusty MX-5 parts to be powdercoated silver. He'd also decided that he didn't want to put edging trim on the wishbones to satisfy the IVA tester, so had 'fillets' professionally welded onto the wishbones to meet the external projections regulations.

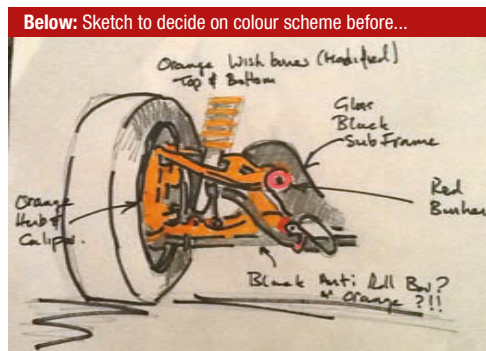
"It's a bit more weight, but the looks are important to me," says Chris. Similarly, John had his parts prepared in orange to ultimately match his chassis. John already knew how to weld, so

taught Luke how to do it. Chris also learnt the skill when he came to adding brackets to his chassis. He says: "I bought a mig welder and went through a lot of scrap metal while practicing..." As well as that, he got some pointers from the friend who did the tig welding on the wishbones.

Both builders decided that the Exocet needed a full-width dashboard rather than the standard (and cheaper) solution of just 'floating' the MX-5 dashpod in front of the driver. For Chris's dashboard, he called upon some experience he had with pattern-making

while on a work placement when he was 16. He made a wooden buck that neatly incorporated the MX-5 dashpod so that a one-piece moulding could be made.

For the Gilberts' build, carbon fibre was often the material of choice. "We decided that, where we were making modifications, we'd use carbon fibre to keep the weight down. At about £75 per square metre, it's expensive to muck up," says John, recalling their early experiments. The dash panel has a few pinholes, but for the later panels they'd improved the technique. "Mum was away for a weekend, so we turned



Below: Sketch to decide on colour scheme before...



Below: ...committing to orange powdercoat. Looks great!



Below: Initial build-up prior to chassis powdercoating.



Above: MX-5 parts ready to be sent for powdercoating...



Above: ...and looking much better on their return!



Above: Hump cut off rear body panel to suit Chris's roll bar...



Above: ...and then split in half to be built to correct width.



Above: Once filled and shaped...



Above: ...a mould was made from the buck...

the dining room into a carbon fibre workshop," says Luke. By then, they'd researched vacuum forming carbon fibre and had made a DIY curing table to achieve perfect, pinhole-free results. Carbon fibre was used throughout the car, for the centre console, rear exhaust panel and as a replacement for the standard Exocet side panels.

Another similarity the cars share is a tubular centre console in place of the standard, more basic arrangement. "I wanted the car to look more finished," says Chris, "and to hide the handbrake mechanism." The final look is different, though, John having got his tubes

professionally bent into curved shapes before welding them in. Chris's is made from straight bars: "I didn't draw it, apart from in my head. I was initially going to curve the tubes, but I couldn't get them right. I knew John's was going to be curved, anyway, so I wanted them to be different."

The additional steelwork didn't end there. Both cars have additional framework at the rear to give the car a more 'finished' appearance. They frame two very different yet distinctive exhaust tail pipes. John ordered his while on holiday in America, but almost didn't receive them. The UPS

delivery truck arrived in the hotel car park just as they were checking-out.

You'll see more personalisation at the back of Chris's car. He wanted to fit a big wing, but didn't want to mount it to the fibreglass bodywork because he didn't want all the downforce to be pressed into the fibreglass. It was John who suggested that it might be possible to mount it to the chassis and, after a few cardboard templates were made to design the supports, it worked. During the construction, Chris suspended the wing from the ceiling of the garage to decide upon its height.

Below: Cardboard was used to make a fuel tank template before committing to make it from aluminium. Exocet usually uses MX-5 tank.



Below: Centre console on John's car has curved tubes.



Below: Tubes trial fitted...





Above: ...and a bespoke panel was the result.



Above: Freshly powdercoated MX-5 parts put back together.



Above: Tubular centre tunnel under construction...



Above: ...before being trial fitted...



Above: ...and then powdercoated.



Above: Car taken back to bare chassis to be powdercoated.

Cardboard templates were a feature of John's build, too, while trying to incorporate design themes from production cars. First he would sketch out a design and then make a prototype in card to fit to the car. This meant that an idea could be honed before committing to fabrication. For instance, he made a cardboard fuel tank before having one fabricated, and even a cardboard battery in order to find a suitable location for the real thing.

The rear bodywork on Chris's car is bespoke. "I liked the simplicity of the Exocet build, especially as it's my first

ever kit. However, I wasn't keen on the back end of the car. I preferred the look of the Rocket from the rear, so my plan was to change the bodywork and chassis to make the car look unique and wider at the back end," says Chris. He was able to take a shortcut to that result when he collected the kit. On the shelf in the MEV factory was a rear panel that MEV's Stuart Mills had started to make for the racing Exocet. It was gathering dust until Chris came along and took that instead of the standard bodywork.

John also got stuck into modifying his bodywork. Unhappy with the shutlines

where the nosecone meets the bonnet, he decided to bond them together to make one panel that, ultimately, would hinge from the front. Having bonded the panels together, he was forced to paint the bonnet – and the other panels to match. He chose a black from the Peugeot colour palette that has a subtle metallic effect when the sun shines on it.

Prior to taking his car for an IVA test, Chris had the suspension geometry set up by Bournemouth based Mike Stokes Motoring and Motorsport, a company which was also responsible for sorting his exhaust. Without having seen an Exocet before, Mike Stokes used data



Below: ...and cardboard templates made for carbon panels.



Below: John and Luke perfected their carbon fibre making.



Below: Engine looking good. Block in now trademark orange.



Below: MX-5 parts being reassembled...



Below: ...and on their wheels.



Below: This was a father and son project, Luke getting stuck in.



Above: Rear structure made to 'frame' the exhaust.



Above: Time to transfer the MX-5 wiring to the Exocet.



Above: Full width dashboard incorporates shape of MX-5 pod.



Above: Spoiler hangs from ceiling to mock-up supports.



Above: Exhaust tip had been on display at Mike Stokes for years.



Above: Aeroscreen template more complicated than it looks!

Useful contacts (Chris)

Kit: MEV, Mansfield, Nottinghamshire. T: 01623 655522. E: info@mevtd.co.uk W: www.mevtd.co.uk
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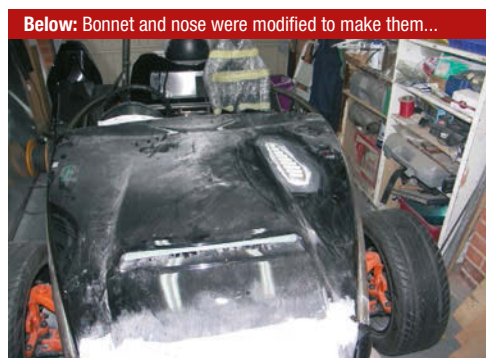
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from a Caterham of a similar size and weight, which has worked well.

There was very little else left to do for both cars. Chris made a template for an aeroscreen, and both cars had screens made from it. Fitted with angled washers that neatly compensate for a lack of symmetry in the bonnet, they look neat. They stand away from the GRP slightly, too, so won't become a dirt trap.

Both cars went to Southampton for their IVA tests, Chris being a month ahead of John. Chris towed his car to the test in heavy rain and, while broadly speaking it went



Below: Bonnet and nose were modified to make them...



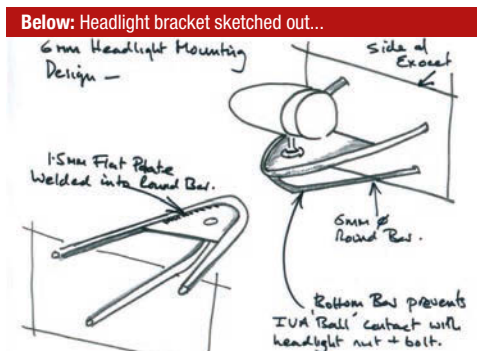
Below: ...one piece to eliminate the shutline between them.



Below: All GRP panels subsequently painted.



Below: Chassis returns from being powdercoated.



Below: Headlight bracket sketched out...



Below: ...before being made.



Above: Geometry set-up at Mike Stokes Motorsport.



Above: Car was trailed to the Southampton IVA centre.

smoothly, there was one issue to address. The LED indicators and sidelights were a single unit switch-back design which meant the sidelights went off when the indicator was activated, giving the appearance that they were flashing at the same rate as the indicator. The IVA inspector didn't like this so it was a minor fail point, a problem that Chris fixed by fitting new indicators and sidelights. He returned for the free retest the next day and the car was given a clean bill of health.

When John had an appointment at the same centre the following



Above: The finished car! The full set of photos of both cars will appear in part two of this story in the next issue.

month (June of this year), Chris attended to lend the benefit of his experience. Again, there was just one fault – this time, the sender in the brake fluid reservoir was the issue. Being local, Chris knew a replacement could be sourced at nearby MX-5 specialist Autolink and a quick dash at lunchtime saw it repaired in time for a pass on the same day.

John's registration didn't go as smoothly as Chris's. The DVLA lost his paperwork, despite it having been sent by recorded post, and it was only when he had sent duplicates that the originals turned up in Swansea.

Consequently, his car had only been on the road a few weeks when we photographed both for part two of this story. It was the first time Chris and John had seen each other's cars, and they had a fascinating couple of hours spotting the similarities and differences. And, despite having set out with similar goals, there were plenty of the latter – as you'll be able to see in the next issue. ■

**Don't miss part two in the November 2015 issue.
On sale from Friday 16 October**



Below: Coming together. Note the centre tunnel in place.



Below: Lots of carbon fibre detailing throughout the car.



Below: Exhaust surround trial fitted; all fuel tank in place.



Below: Detailing for exhaust surround coming together.



Below: Reverse and foglight mounted to carbon fibre panel.



Below: Finished car is immaculate. See it in detail in part two.

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Our Cars

James and John have been making the most of their kit cars, with trips to shows and progress in the garage by both – and John has also just bought a two-wheeled addition for his garage. Meanwhile, Adam has had a mini victory in getting the Riot MoT'd and taxed... just in time for the end of summer.



James Horsley

PROJECTS

Apal buggy and Nova

THIS MONTH

The buggy comes back out of storage for an appointment at Goodwood, and Nova progress continues.

Having been celebrating the extra space available with the buggy in hibernation, I'd hoped to make great progress in the last month. Then a letter arrived from the Goodwood Road Racing Club to confirm the buggy had been accepted into the Member's Display. Great – a free meal in the ballroom and a lovely family day. Bugger – I had to collect the buggy and get polishing!

Once that had been retrieved, I persevered working on the Nova alongside the buggy. Ahead of engine fitment I have decided to get some paint laid down on the shell. I have a provisional date booked with the paintshop (still haven't decided on a colour) and the time in the run up to this is to be spent test-fitting panels and trying to ensure as many holes have been drilled as possible.

The bonnet needed some work, as the air ducts rear mouldings were cut off to remove it from the mould. The two parts were supplied, but needed glassing back

together. I decided this was potentially beyond my crude GRP skills so passed it to Andy at Westgate Composites. This also gave me the opportunity to collect the lower side panels, and discuss some other

alterations I had planned. Andy also gave me a tip for making up panels and using a glass panel as a base – nothing sticks!

With that top tip in mind, I found the old rear windows from the buggy's donor

Below: Buggy on display at Goodwood...



Below: ...as James's previous kits have been!





Above: A tip from Andy Westage was to use glass as a smooth base to make GRP panels.



Above: Rear window 'tunnel' repaired and sprayed up. Looking much better now.



Above: Rivet in captive nuts, sourced from Car Builder Solutions.



Above: Captive nut fitted – James used nine per side panel to spread load.



Above: Lower Nova panel join will have a T-piece rubber trim fitted.



Above: Alex from Club Nova came up trumps, moulding new dash pods for James.

Beetle and got mixing. I wanted some flat rear headlight covers for the inner wings. I made up two rectangles of GRP matting first and, once cured, peeled it off the glass and cut to size. Now painted, I am pretty pleased with the result. I also gave the rear window 'tunnel' a lick of paint now this is all repaired. I have fitted rivnuts into the tub for this part to be refitted.

Moving to the newly repaired side panels, I wanted these to be easily removable, but felt rivnuts might be tricky if they spin in position, as they're hard to reach. I turned to CBS and used some of their captive nuts which are riveted in. Two small holes are drilled for countersunk rivets and a central hole

drilled for the main bolt.

The corresponding panel just needs a bolt hole, which I made oversized and then used large spreading washers to spread the load. A larger hole gave me flexibility if my holes didn't line up perfectly. Pleasingly, with nine fittings each side, all went in well and helped draw the panels together to reduce the panel gap to a satisfactory appearance. Once painted, I will use a small T-piece rubber trim between the parts.

Carrying on my mission to source a full set of complete Nova panels, I managed to persuade Club Nova member Alex to make me a set of dash pods from his moulds. The results are outstanding –

I now have a super smooth pair of dash pods, which are better than the originals I had on my last Nova! Thanks Alex.

Post Goodwood, the buggy came home with a nice souvenir – a printed-up info sheet. I have added it to my collection from previous entries – I may need a larger garage soon, as there is little wall space left! The buggy has one more outing planned this year, CarFest South, and then may head back into hibernation for Nova assembly. The next couple of weeks will be spent undoing all of my hard work by stripping the Nova back to a pile of parts – but hopefully the effort now will pay dividends when I assemble it next.



John Dickens

PROJECT
UVA Fugitive

THIS MONTH
Another Volkswagen show – and the Fugitive also gets some new stoneguards.



When the vinyl wrap on the car was finished, an extra layer of clear 'stonechip' vinyl was added over the high wear areas on the cockpit sides and the front of the rear mudguards. This vinyl is thicker than the normal wrapping vinyl and does not conform as well to complex curves. In fact, on the cockpit sides, it had to be removed and replaced by thinner clear vinyl wrap straight away as it simply would not take the correct shape. We thought we were OK with the rear mudguards, but tiny creases soon started to appear around the edges and once dirt got into these they looked shabby. I tried replacing the vinyl myself, but the problem reappeared so I decided to go down the conventional route with some carbon fibre stoneguards.

Obviously commercially available ones would not fit the unique UVA mudguards, but fortunately I still have the moulds I used to make them so

I could use these moulds to make the stoneguards too. After the usual waxing process I laid-up a layer of clear gelcoat, a layer of carbon fibre and a layer of black tinted tissue then left the laminate for a few days to cure.

It popped out of the mould OK, but I was a bit underwhelmed by the overall appearance. There are quite a few small air bubbles trapped in the weave and the gelcoat is slightly cloudy in places. Maybe the resin is a bit old now? I'll see

Below: John parked alongside a couple of manic Yorkshire Ghostbusters at Harewood House.



how it all polishes up.

Before I got round to fitting the stoneguards, I heard about another VW show, this time at Harewood House just outside Leeds. This involved a 170-mile round trip but with the demise of most of the original kit car shows the only way to get the car out, about and seen is to attend other car shows instead.

I set off at some stupid hour on a Saturday morning and arrived around 9.30. Unfortunately it had rained heavily the previous day and for some reason the stewards were directing all the cars through the car parking field which turned into a quagmire. I wasn't best pleased but some of the concours car owners were definitely not happy. My folding bucket came in very handy. The show itself was good with some very interesting VWs and a smattering of kits. I also found a Beetle with an absolutely amazing turbocharged fuel injection conversion. That gives me something to aspire to when I convert mine.

This month I also did what might possibly turn out to be a very silly thing. I went and bought a very rare (in the UK) 1974 Honda CB350F, a 350cc four-cylinder bike. To make space, the Guzzi is now on its holidays at Pete's (as usual) and I've got a new toy to play with. No restoration though. Just fettling and riding – honest!

I finally found time to trim, polish up and fit the stoneguards I made earlier. I was going to mount them using rivnuts and dome headed allen bolts but that would leave fixing holes if I ever decided to remove them so instead I went with



Above: Even after John carefully replaced the clear vinyl, small wrinkles gradually appeared.



Above: Using the original mould, he laid-up one layer of carbon and one of tissue.



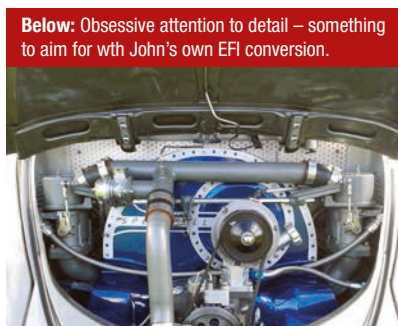
Above: It came out of the mould OK but the finish was not what John had hoped for...



Above: ...but the stoneguards looked fine once they were in place.

double-sided tape. No holes, but trickier to remove without damaging the vinyl finish I would imagine. Although I was initially a little disappointed with the quality of the carbon fibre sheets, they looked fine when they were polished

and fitted and, over time, they will get marked anyway so I'm happy enough to continue with them. Ultimately, though, I think I preferred the look of the car without the guards but they are there for a purpose.



Below: Obsessive attention to detail – something to aim for with John's own EFI conversion.



Below: John has just bought a Honda CB350F – but it's not as tidy as this one!



Adam Wilkins

PROJECT
Sylva Riot

THIS MONTH
MoT and tax for the Riot.

At the beginning of the year, I had set the goal of getting the Riot's engine swapped and the car MoT'd and taxed in time to drive it to May's Stoneleigh show – I just never specified Stoneleigh of which year.

In reality, the engine was swapped in time for Stoneleigh, but the MoT and tax bit didn't quite work out. The idea was to use the run to the show to bed the car in before the CKC/Omex track day later the same month. As it turned out, after a rolling road session at Northampton Motorsport just in time for the track day, it ran faultlessly all day at Llandow anyway.

Then I put it back in the garage and that's where it stayed for three months. How quickly does time pass?

Actually, it was *almost* faultless at Llandow. One of the driveshaft boots split during the day, which I forgot all about until I pulled the car back out of the garage the day before the MoT. A repair kit was fitted, but was even less effective at keeping the grease in than the damaged original. So that was a failure point, as was a wheel bearing that I finished off on the track day. Otherwise, though, the car had a clean bill of health so, for ease, I booked the repairs in at the MoT station on the

same day as the retest.

The morning after the pass, I went online to tax the car (paying for all of August but only getting the last eleven days) – and it pretty much hasn't stopped raining since. Still, a little trip out to the South Downs one evening made it all worthwhile. Shamefully, the previous engine issues mean that the car has covered under 300 miles since the last MoT certificate was issued. I'll try harder this time! Oh, the gear linkage needs some attention, which it will receive if it stops raining long enough to get the car out the garage again. ■



Below: Driveshaft boot cut off for repair kit...



Below: ...which lived up to its 'temporary' billing.



Below: Back on the road!

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Tool Test: Screwdrivers



James Horsley puts a range of non-standard screwdrivers through their paces. Which do you need in your tool kit?

Continuing our theme of tool tests, this time we look at the humble screwdriver. Not so humble any more – our regular tool company contributors were all tasked with supplying innovative versions of this must-have tool.

We all end up with a favourite screwdriver in our tool kit and inevitably we abuse it by using it to open tins, mix-up filler, even as an occasional chisel! Hopefully this selection will help demonstrate there are many screwdriver options out there, meaning you can find the right one for the job you are planning.

Laser angled screwdriver

Manufacturer: Laser (www.lasertools.co.uk)

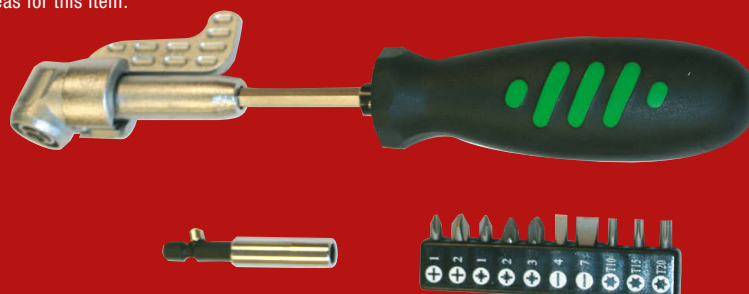
Stock number: 2517

Expect to pay: £15 (list price £14.84 plus VAT but many deals online)

Other products: Many other styles of screwdriver available as well as standard designs.

Guarantee: 12 months

Laser has supplied a neat angled screwdriver for this test which has an attachment that can be used with the supplied rubberised handle, or in a power drill. This option is certainly appealing for repetitive work. An angle bracket on the driver part can be positioned at any angle and used to brace the unit to prevent it twisting, particularly when used in a power drill. If not required, this part can be removed. The gearing feels smooth and the head locks the bit holder in firmly. I found this simple to use, and certainly provided options for awkward fittings where a direct line of sight/reach is not available. The screwdriver comes with 10 bits: two flat, two Phillips, three positive and three-star bits. Under-dashwork, or restricted engine bays, could be ideal working areas for this item.



Advanced Professional eight-piece screwdriver set

Manufacturer: Halfords (www.halfords.com)

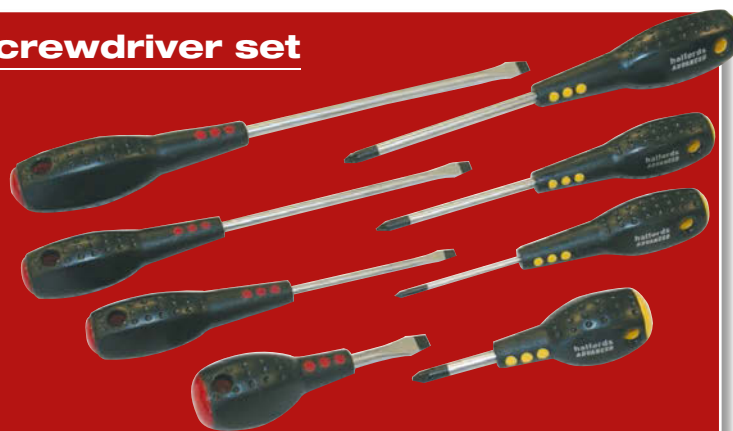
Stock number: 630859

Expect to pay: £15 but deals often available online

Other products: Many other styles of screwdriver available as well as standard designs. See other item on test.

Guarantee: Lifetime

Halfords has supplied two products this month. The first is a standard style screwdriver set from their Advanced range. As with all items in their range, this eight-piece set comes with a lifetime guarantee. The screwdrivers offer a rubberised coating and are a good standard toolbox item. The lightweight plastic tray they are supplied in could be used in a tool cabinet drawer, though is not tough enough for wall-mounting.



Advanced Professional pound-through screwdriver set

Manufacturer: Halfords (www.halfords.com)

Stock number: 926378

Expect to pay: £25

Other products: Many other styles of screwdriver available as well as standard designs. See other item on test.

Guarantee: Lifetime

Halfords' second set will appeal to those who know they abuse their standard screwdrivers; these pound-through screwdrivers are designed for abuse. They feature metal ends to hit with a hammer to help free-up stubborn screws. Anyone stripping an ancient donor car may find these useful. A neat feature I liked was the protective ring that can be slipped over the ends to prevent any errant hammer blows catching the knuckles! In addition, the handles are a tough rubber finish with good contours to aid grip. Whilst you may not use these every day in the garage, they will protect your regular tools if used for those tougher tasks.



Draper 14-piece three-in-one angled screwdriver

Manufacturer: Draper (www.drapertools.com)

Stock number: 43984

Expect to pay: £15 (list Price £16.74 plus VAT but many deals and promotions online)

Other products: Many other styles of screwdriver available as well as standard designs. See other item on test.

Guarantee: Lifetime

Draper has also supplied two products for this test. The first, an angled screwdriver set, is another version of the Laser item reviewed. The handle and gear part is identical, and also offers the ability to use it by hand or with a power drill. Again, this makes it ideal for restricted spaces. The bits provided are also a 10-piece set, this time comprising cross slot, flat head and hex bits. With the price and quality of the Draper and Laser versions of this tool being so similar, your choice may well come down to the type of bits you use the most.



Draper six-piece pound-through screwdriver set

Manufacturer: Draper (www.drapertools.com)

Stock number: 40005

Expect to pay: £20 (list Price £37.80 plus VAT but many deals and promotions online)

Other products: Many other styles of screwdriver available as well as standard designs. See other item on test.

Guarantee: Lifetime

The second Draper set is another pound-through screwdriver set. Much like the Halfords set, this is ideal for demolition of a donor car, or freeing-up those stubborn parts on your kit. The handles have a rubber finish and are comfortable in the hand. Unlike the Halfords pound-through items, the metal striking surface is at the end of the screwdriver flush to the handle. It is also slightly convex which does raise the risk of a hammer slipping off the striking surface and catching your hand, particularly as no protective rings can be attached. A useful set, but a little more care may be needed with use.



Sealey gearless ratchet driver and 34-piece bit set

Manufacturer: Sealey (www.sealey.co.uk)

Stock number: AK6498

Expect to pay: £20 (List price £25.95 plus VAT but many deals online)

Other products: Many other styles of screwdriver available as well as standard designs. See other item on test.

Guarantee: 12 months

Sealey has supplied two items for review. Firstly the gearless ratchet driver and bit set. This has similarities to other items tested, but is a straight screwdriver design. The mechanism is very smooth and reversible, and when in use doesn't require any back movement to engage gearing like many socket wrenches. The handle is a tough plastic design which could be slightly slippery if exposed to oil etc. The end of the screwdriver has a storage cap which is removable and offers access to a storage canister for popular bits you want to hand. A useful selection of hex, star, Phillips, flat and posidrive bits are included in a rubberised case with lid. Bit retention is managed by a magnetic holder.



Sealey two-piece damaged screw remover set

Manufacturer: Sealey (www.sealey.co.uk)

Stock number: AK4319

Expect to pay: £10 (list price £12.95 plus VAT but many deals online)

Other products: Many other styles of screwdriver available as well as standard designs. See other item on test.

Guarantee: 12 months

The second Sealey item is a set of two damaged screw removers. These screwdrivers appear initially to be standard flat head and Phillips head items, but closer examination shows them to have specially cut heads to help them engage with damaged screw heads. A previous owner of my Nova project has decided the best interior trim was tile edging secured with wood screws. It is no surprise that these had rusted well over the years and the heads were in poor order. To my surprise and delight the flat head remover worked a treat providing sufficient pressure was applied.

For more stubborn screws the drivers also feature hammer thru ends. After a few experiments in the garage on various stubborn screws I did notice the tips start to sustain some damage, but they still performed well. Realistically these are not everyday tools, but if to hand when that stubborn screw shows itself they could save valuable time.



Kraftwerk 114-piece universal bit set

Manufacturer: Kraftwerk (www.kraftwerkukshop.co.uk)

Stock number: 99068

Expect to pay: List price £87.98 including VAT

Other products: Many other styles of screwdriver available as well as standard designs.

Guarantee: Lifetime

Kraftwerk's set offers 114 parts. The main item is a nicely finished folding case comprising a comprehensive selection of standard sized screw driver bits. These include most possible size options for posidrive, Phillips, flat, torx, star and hex bits. In addition, selected popular options are included in a longer 75mm bit. The screwdriver supplied with the kit is a barrel design which can be unlocked and adjusted to a pistol grip design. An end cap is removable and offers access to a storage canister for popular bits you want to hand. The screwdriver can be used in ratchet operation or as a fixed head. Two bit holders are supplied, a standard bit holder and also a chuck style bit. The chuck bit prevents bits falling out and has a useful spinner style grip. It is slightly wider, so may be less suited to tight spaces, but for the majority of locations offers useful functionality. This comprehensive kit would cover a host of scenarios in a tool box.



Wera Kraftform Kompakt 60 RA

Manufacturer: Wera (www.wera-tools.co.uk)

Stock number: 05 051040 001

Expect to pay: £45

Other products: Many other styles of screwdriver available as well as standard designs.

Guarantee: Lifetime

Wera's Kraftform Kompakt 60 RA set follows the format of many of their tool sets. It is packaged in a nice material pouch which holds the 16 long screwdriver bits and the screwdriver itself. The screwdriver features a ratchet operation which is reversible or the screwdriver can be used in fixed mode. The rubberised plastic handle is non-slip and an ergonomic design. The screwdriver bits are attached using a locking chuck design which holds them tight. All bits supplied are 89mm long meaning that the locking chuck is away from the tip of the screwdriver bits. The ratchet action is smooth and requires little movement for fine adjustment. The use of the chuck close to the handle helps in tight spaces. With common hex, star, flat and Phillips bits provided this is another great item for your tool box or car tool kit.



As this article shows, there are many options out there when considering the humble screwdriver. As with many of the new tools on the market the key is to consider the tasks you will commonly need to undertake, and what tools can help achieve this successfully. If embarking on a stripdown of an older kit or donor car, then some of the tougher options detailed will be invaluable. If topping-up your tool set to have tools on

hand in your kit, the smaller sets could offer great functionality in a small set at modest price.

With the tools tested ranging from £10 through to £90, there is also a great selection of tools for all budgets. If you are planning a particular build/task many of these innovative tools can offer you great benefits at a modest cost. ■

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John Clements

PROJECT
Tiger Cat

AGE
63

OCCUPATION
Heating engineer

PROJECT START
July 2001

I got a bit lazy for a couple of weeks after writing the last instalment, then our elder son decided to return home to live for a while. Good news is he is another practical petrolhead, bad news he has nearly as many tools, equipment and other sundries (aka junk) as me. Quite a while has been spent rearranging everything to fit these in, along with other bits, and another cat (no, not a Tiger Cat, a real moggie appropriately named Kitcat).

We now have between us: two large tool chests, two compressors, three sets of ramps, two car creepers, four sets of axle stands (and we both have an odd one, must be like socks and washing machines...) and pretty much a partridge in a pear tree! Just to complete the fun, I got an eye infection, which then went from the right one to the left, leaving me half blind for over three weeks and unwilling to risk any activity that generated dust or required accuracy.

My nominal eight weeks of activity was now reduced to eight days. That's got this month's excuses in! As I now want to work on the front of the car, logic suggests that I turn it round. My garage has the bench and pedestrian door at the back and the car is presently facing out the double doors that only open from the inside. But before that, some working brakes will be handy (see my previous exploits on handbrake alone...).

I bought a cheaper version of an airline powered bleed tool at Stoneleigh, so I rigged that up to a convenient front caliper and, although there was a lot of air hissing through the tool, there was no fluid coming down the pipe.

An EziBleed appeared in my son's equipment (not my missing one, I'm assured) and it also failed to produce fluid from the bleed nipples. Oh dear. With a master cylinder outlet disconnected, the tyre connection to the EziBleed was reinstated – not a drop of fluid.

I used the airline tool to empty most of the reservoir, then a small syringe to finish the job. Quite a bit of dark brown viscous fluid at the bottom. Final removal meant



Above: The original brake master cylinder needed to be replaced.



Above: Semi-solid debris in the inlet.



Above: Syringe used to remove the old fluid.

fluid dripping everywhere and the inlets from the reservoir were also well coated with the brown gloop. I'll play around with most things but I like brakes to be 100 per cent so a new master cylinder was ordered from brakeparts.co.uk.

That arrived with respectable speed and, in my opinion, at reasonable cost. But in the meantime, I fitted the side repeaters to the front wings, ready to fit when access is easier. I also fitted some trim bits and edges and cleaned some interior bits and bobs just to keep busy.

Some of you may be thinking why didn't I just open the main doors to get access to the front? Why wait until I can turn the car around? Two reasons, firstly there were large numbers of wasps taking a fancy to a plum tree alongside the drive, immediately outside these doors. My wife covered them, the tree (and my MX-5) in white powder to little effect.

When most of the wasps had finally moved on, the huge field surrounding our house, that had grown oil seed rape,

was being fertilised and disc harrowed. The fertiliser, origin unknown but I have my suspicions, is well rotted, but even so the atmosphere was best described as 'bracing', and the smell lingers (shall we say). So the doors stayed shut.

When I originally built the car, I didn't use the old nasty brakes from the Sierra, but got a new master cylinder from a local auto factor. It looked the same, but had a smaller mounting flange that used 13mm bolts. The new one is the correct, larger flanged version, using 17mm bolts.

Two new 10mm holes have been drilled through the steel supports and filed into slots with the original ones. With the pedal assembly bolted back into place, the holes through that got the same treatment. The push rod now sat nearly 1cm further out towards the pedal, no more spacers needed – another unseen difference. Finally mounted, the pipes all lined up, and the reservoir fitted, fluid put in and the whole thing went full cycle as we tried to bleed the brakes.

Winning method was a combination of the pressure from the EziBleed, coupled with a good old fashioned double act – you press the pedal, I open the bleed nipple. Quite a bit of dark fluid emerged before it ran clear and we finally got a pedal with adequate pressure. I'll give it a while then have another go and completely flush out any old fluid, if any is still there. At last, all ready to turn it around and have a better go at the front.

Next issue

STUART BRUCE-JONES
AGM WLR

JASON BURRAGE
DeHavilland DVT GTS

ROB DAVENHALL
Midtec Spyder

CHRIS HAYSOM
RoadRunner SR2

JIM HODGKINSON
JZR

TOM HYLAND
Raw Striker

VIVIENNE LODGE
Westfield SE

Below: Indicator repeater mounted for IVA.



Below: Kitcat in the kit car!





James Shipperley

PROJECT
DDR Miami GT

AGE
30

OCCUPATION
IT manager

PROJECT START
July 2012



Above: New laser cut DDR logo identifies car.



Above: New coil-overs a big improvement.



Above: The wastegate retaining clip that was AWOL.

I'd been having a good time with the car recently, with all the little niggles being sorted one by one and the issues disappearing. One of the next things I wanted to do was to badge up the car, but I wanted the badge to look good especially as it was something people would look at. So I came up with a design and sent it over to a laser cutting company to cut the logo out for me. I then had it sprayed black. It came out great and I'm really happy with it.

At this point, I upped the boost properly. It felt a bit weird – oh the joys, that might be the clutch slipping. So I tested with third gear and low revs and it had a very slight slip. I had a big trip coming up in just over a week so I had to decide what to do.

I got myself a new Toyota OEM clutch and changed it myself. The job itself wasn't hard, but it was very time-consuming. Even with all the space in the car, changing a clutch isn't the easiest, from aligning the clutch to putting the gearbox back

on. With the right tools, I'm sure it would be easier. Eleven hours later, it was all back together and working – my first (and last I hope) clutch change done. I also took the opportunity to fit a new Toyota rocker cover gasket to solve the last oil leak which had been annoying me!

I ordered my new coil-overs to fit, which were some Meister R items (www.meisterr.co.uk). It was like night and day for the road, a much better ride. Still hard, but enough give for the road. It was amazing to have a car that drove just that bit softer. With such a rigid frame and all polybushed suspension it needed some give. I also managed to lower the car at the rear another 10mm which makes the back look that bit better.

Following the work was the biggest journey yet. A 220-mile round trip for a charity event called the Teddy Bear Run (www.teddybearrun.com). It was a good day out and the car made it there and back. I felt like Damon Hill in an Arrows at the Hungaroring, though. A

small retaining clip fell off the arm that keeps the turbo wastegate shut and I lost all boost for the 65 miles back, so max speed was about 65mph.

Since then, I've been using the car and am up to 1000 miles since I rebuilt the head with no major running issues and the power near enough where it should be.

My work is now focusing on redesigning areas of the car such as the seats and interior. All work I look forward to doing over the winter so next year the inside is as good as the outside.

I built this car so I could be the first customer in the world to complete and have a road legal DDR. I completed my goal but I did learn being the first to do something is not easy and often requires you to be the second to do it as well because you'll end up doing parts twice. It's probably an appropriate place to leave my running reports, but hopefully I can give you another update next year when the interior has all been done as well.

Below: The DDR on the Teddy Bear Run, a charity event. This is James's final report until the interior is changed next year – full feature coming soon.



"Being the first to do something is not easy and often requires you to be the second to do it as well because you'll end up doing parts twice"

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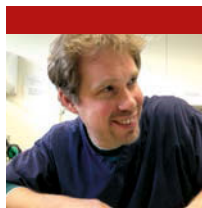
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Ed Morton

PROJECT

Nova hybrid

AGE

43

OCCUPATION

Veterinary surgeon

PROJECT START

July 2012

Hmm. I promised myself I wouldn't have to resort to an update like this when I started this project, but there's no getting away from it, not a lot has happened since last time.

The Minx beach buggy project has, predictably, used up more time than anticipated, and my GBS Zero has finally had some proper use. But if I'm honest, the main problem has been the irresistible lure of classic car shows coupled with some shamefully rose-tinted nostalgia.

I'm at a difficult age, where wedge shaped silliness from the 1970s and 80s has a special significance. It explains the Nova I suppose. The problem is, these cars are available, relatively affordable, and best of all ready to use straightaway. I came close, more than once. But I didn't and, looking back, I'm relieved; even though my list of previous missed purchasing opportunities is a long and depressing one.

We've a lot in common with classic car owners, and with dwindling show attendances and increasing levels of bureaucracy it probably makes sense for us to combine forces where possible. But having said that, the relationship we have with our cars is potentially very different. I know every inch, wire and nut of my GBS Zero, because I built it from a basic chassis and set of body panels. It would take years to develop that same level of understanding of, say, a TVR Tasmin or



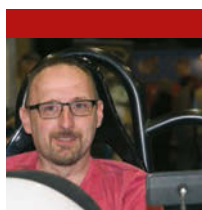
Above: Not much progress on the Nova this time. Ed is currently looking for wheels to replace these...

Lotus Elite, just to pick two completely random examples... ahem. Which is why I eventually decided to stick to kit cars, for the time being at least.

That said, the three-day Silverstone Classic is a brilliant event, even though the weather this year was unhelpful, and entirely justifies losing three days in the garage. All of motoring life is there: dashing chaps in E-Types, angry-looking men in snorting fast Fords and even a few complete arses in the Italian exotic enclosures, although the bright orange Porsche Boxster parked diagonally across two disabled spaces at my hotel takes top prize in that category. The racing is entralling, and the open access pits are a masterclass in chassis

design, construction and evolution.

I have spent some time on the Nova – although sadly not in the garage. I need some wheels and, for various aesthetic and clearance related issues, I need a combination of 6in by 15in with ET45 and 7in by 16in with ET15, preferably in a suitably retro style. Naïvely, I assumed this would be straightforward, but not so. Much internet searching revealed a few wheels that fitted the size criteria, but the designs are a little uninspiring. Three-piece split rim wheels are an option, but would probably cost around £1500 for a set, which is more than I wanted to spend. Research continues...



Ian Jackson

PROJECT

GKD Legend

AGE

46

OCCUPATION

Police officer

PROJECT START

March 2015

We are at installment three now and I am amazed at how quickly the car has come from a skeleton of tubes to a rolling chassis. All the body panels have been trial-fitted and drilled and it is possible to see the shape of a car emerging. My next job is to get the electrical systems sorted out and working before fitting the engine and gearbox.

One of the plus points of the Legend build is that it retains much of the donor BMW electrics. The dashpod from the BMW holds all the warning lights and the Legend dash is designed to take the pod.

Another advantage is that BMW designed the electrics well. The engine loom has one main multi-plug and it was a simple job to remove the components. First job is thus to cut

Below: BMW wiring is well designed, which makes it easy to transfer into the GKD.



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Above: Dash pod is retained from the donor and fits into the Legend's dashboard moulding.

out the opening in the dash for the BMW pod. This brings on another first for me – the itchy scratchy world of fiberglass. Oh joy.

When I stripped the donor, I was careful to strip out the entire loom, so by using the BMW wiring diagram I identified the wires for the rear lights, indicators etc and started removing the excess wires from the loom and then placing the wires in rough position. The kit also uses the BMW fuel pumps and senders. Again, these were simply removed and screwed into the supplied fuel tank. I used a mix of cable ties and conduit to hold the wires in position whilst working out the runs.

There are pre-made light pods but these don't fit the look I want (at least not on my budget). From previous projects, I had a number of Lucas type lights and these were duly unearthed from my stores and pressed into use. To keep the IVA examiner happy, I need to mount the lights vertically and, after some searching about, I found some ABS electrical enclosures of the right size. A little drilling and filing later

and I had a pair of light units.

Working forward to the dash and bulkhead, the BMW multi-plugs were screwed and clipped into pre-cut holes. Excess lengths of wire were removed by cutting and soldering, using heat shrink to protect and insulate the new joints. The final job was to sort out wires to the front lights and radiator, and then I had a 'working' loom

The only headache in the process was to sort out the fuses and relays. BMW seems to fuse and relay everything and a lot of these are now redundant. I would say about 80 per cent of the loom was not needed.

After connecting up the battery and making a couple of tweaks, I had working lights and indicators. The fan switch was found to be faulty but exchanged by Car Builder Solutions without problems on one of my shopping trips there.

With the loom in place, the next job was to fit the engine and gearbox, which meant taking the car off the trestles and putting it on its wheels. This in turn meant fitting

the shock absorbers – again built to GKD's design.

The engine fitting was an excuse to invite a few friends over to help out and was accomplished in a couple of hours. Prior to fitting the engine, I took the opportunity to change the clutch, replacing the BMW dual mass unit with a conventional unit. Also, I found the slave cylinder was leaking, so this was replaced prior to mating the engine and gearbox together.

With the car on its wheels, the engine and gearbox fitted and the bodywork loosely fitted, there was only one thing to do – sit in it and make the obligatory 'vroom vroom' noises...

Next, I quickly fitted the engine loom and ECU and tentatively turned the key. After a few cranks and many coughs and splutters, the engine caught and my garage resonated to the sound of an unsilenced six-cylinder engine, whilst spitting flames out of the head direct to my powdercoated chassis.

A milestone had been reached. The car is alive!



Above: Engine already in! Progress is swift.

Below: Radiator in.



"My garage resonated to the sound of an unsilenced six-cylinder engine"

Below: A milestone reached – the car has been fired up for the first time.





Andy Green

PROJECT
Healy Enigma

AGE
48

OCCUPATION
Mechanic

PROJECT START
March 2014



Above: EGR valve removal plate.



Above: Engine mount has been raised.



Above: Exhaust flanges.

I've finally got my backside into gear on the Enigma. Every time I looked at how much work was left to do to marry the Mazda MX-5 shell to the new chassis, I would conveniently find an excuse to do something else. But some things you can't put off forever and so it's back out with the welder with a vengeance. Making up the patches to fill in all the gaps and then tack them into place is very time-consuming and mentally taxing but, if you work through it methodically, before long the end is in sight. I am now much happier with the way things are progressing and hopefully it won't be long before the reassembly process begins.

I've decided to change my approach to the build. Rather than making everything look nice before it's fitted I'm going to just chuck it all together, make sure everything fits nicely and then take it all apart again ready for the final clean, paint and polish. I've also decided to have the IVA test done before painting, just in case (plus I can't decide on a colour).

There have been a couple of other issues that needed addressing. One of which was the positioning of the engine (it still wasn't right). The front crankshaft pulley was very close to the steering rack, which normally would mean raising the engine, but I couldn't do that because of clearance issues with the bonnet. I finally figured out (and it took a while) that if I lowered the subframe with the steering rack attached I could then raise the engine and not hit the bonnet. Ride height issues can be addressed later with the adjustable coil-overs. I made some 20mm thick spacer plates to go between the subframe and chassis and then raised the engine mounts by 20mm. Problem solved. The only issue was that now the steering column didn't fit correctly but luckily I had only tacked it together just in case and was therefore easily fixed.

The other issue I had was the oil filter connection. I knew I had to fit a remote oil filter, but the original housing was very large and the take-off plate would foul the subframe (even with the raised engine). Thankfully, though,

some aftermarket tuning parts are becoming available for the 1UZ-FE engine and one of these is a very nice take-off plate that replaces the whole housing. Job's a good 'un. There were some other parts that I couldn't resist as well. EGR removal plates and exhaust manifold flanges. Hooray for t'interweb.

I've also decided that the Enigma should be built at home rather than at my workshop, but my home garage definitely isn't big enough for a car and all the parts, car tools, DIY tools and other paraphernalia that is needed when you build a kit car. So I've ordered a large garden workshop

that hopefully will allow me to remove everything from the garage apart from the workbench and tools. Can't wait!

The Zero hasn't been without its problems, either. When I rebuilt the engine, I used a standard Ford Zetec bottom end and lowered the compression ratio with a decomp plate. I'd done some research on what punishment the standard pistons and rods would take and, as long as you don't rev the engine too high, they should be able to handle fairly high horsepower. So I brought the compression ratio down to 8:1, capped the rev limit at 6800rpm and fitted a smaller supercharger pulley



Above and below: Andy is mating MX-5 centre to Healy, requiring a lot of in-filling.



Below: The plan is to get it all fitting first, then take it apart to make it look nice later.



to compensate. When I took the car for remapping, it was apparent that the inlet temperatures were too high (80dec C), even with a water/air chargecooler. So the next purchase

was an Aquamist kit which was complicated to install with my set-up and ECU, but the help from Aquamist was fantastic and it wasn't long before it was back on the rolling road.

I had to fix a small boost leak in the plenum but the car is now back up to 300bhp and inlet temps are under 40dec C. Time will tell if the standard rods and pistons survive.



Jon Page

PROJECT
GBS Zero

AGE
36

OCCUPATION
Broadcast engineer

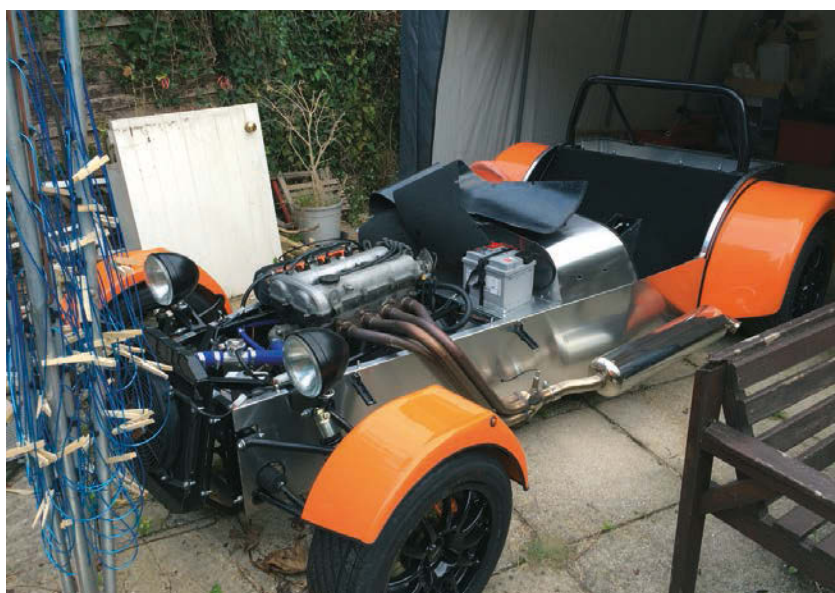
PROJECT START
April 2013

Not a great deal of progress in the past couple of months. This is a busy time of year at work so I've been away, and I am still trying to get my hundred-year-old house liveable. I've been able to do a few bits to the car but not as much as I would have liked.

The coolant circulation issue appears to have been solved with a new alternator belt. I had put the original Mazda belt back on after changing the alternator for a smaller one, but it was quite loose and perhaps not turning the water pump properly.

It seems the Instant Garage in which my car currently resides gets a bit hot under the sun and an unfortunate side-effect has been to melt the glue holding the carpet on inside the car. I got back from two weeks abroad to find all the sections of carpet detached and rolled up in the footwells. The carpet behind the seats had also come off, meaning I had to take the seats out to get it all back in. Putting it all back in again probably took a couple of evenings' work. I would rather have been doing other jobs, but this time I have used almost an entire can of spray glue in the hope that quantity will prevail.

One job that looked quite quick turned out to be very fiddly. I was reading someone's report on their IVA test which mentioned the examiner wanted him to turn the bolts holding



Above: Not much space on the patio, but at least it's cooler than being inside the Instant Garage!

the rear lights round so they wouldn't puncture the fuel tank in the case of a rear impact. I checked the bolts on mine and could see what he meant, so set about changing them round. There is about an inch of space between the rear panel and the fuel tank, and the bolts are about 4in down. Each nut needed to be unscrewed from the tank side as the other end sits in a moulded recess in the reflector. I had to make a longer spanner to get to them, and each light took about two hours to do. This is one of those things that will stick

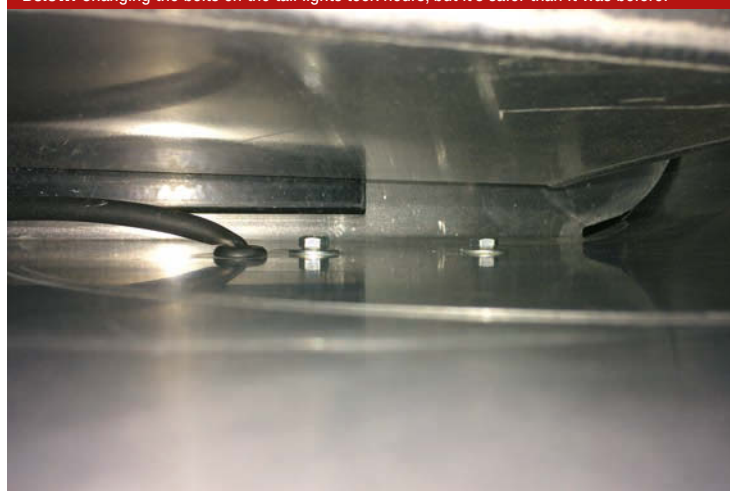
in my mind for future projects...

Lastly, I have fitted a lambda sensor on the exhaust and am trying to make it work with the ECU. I can see the principle at work of adjusting the injector duration when the sensor reports the air-fuel ratio but I think the ECU is reacting too quickly and will not let the engine accelerate smoothly when in closed-loop mode. The engine and emissions are my main concern now and is the area I am probably most interested in but still don't know enough about. More thinking required.

Below: New alternator belt has improved the cooling issue.



Below: Changing the bolts on the tail lights took hours, but it's safer than it was before.



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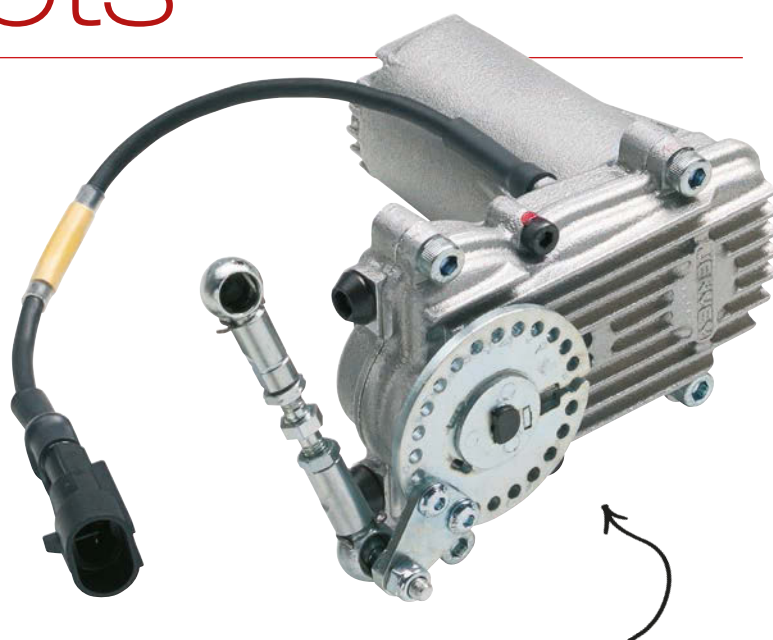
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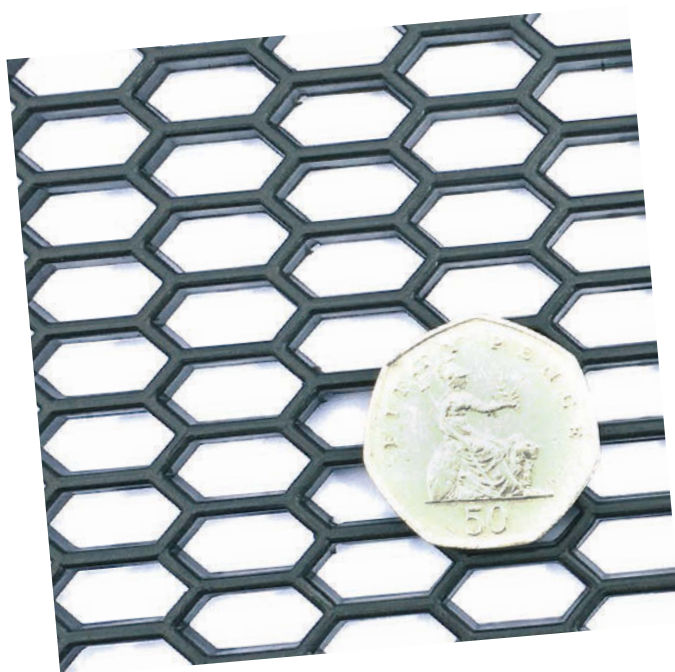
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Exhaust Silencing

What do you need to consider when choosing an exhaust? Chris Pickering talks noise and emissions...



It all used to be so simple. Once upon a time, all the exhaust pipe really had to do was provide a means for burnt gasses to escape the engine. If it could do so without deafening anyone or asphyxiating them, that was generally considered a bonus. But these days things are a bit more complicated, not least when it comes to the IVA test.

The exhaust plays a big part in the character and performance of an engine, but before you can enjoy those you need to get your car on the road. And that means satisfying the IVA's requirements for noise and emissions.

The noise test is straightforward enough and carried out in the same way

"The exhaust plays a big part in the character and performance of an engine, but before you can enjoy those you need to get your car on the road"

that it would be for most track days: a noise probe is placed half a metre away from the end of the exhaust at 45 degrees to the direction of the tailpipe. The engine is then revved to three-quarters of its maximum power speed (or two thirds of the maximum engine speed if that's not known) and must not exceed 99dB. This is the same for all cars, irrespective of the age or origin of the donor parts, but it does pose more of a challenge for some than for others.

"Some of our early exhausts were very close to the limit,

but now our standard exhaust comes out at about 88dB," comments Simon Firth, workshop manager at Great British Sports Cars (GBS). Although the company has fitted everything from Mazda rotaries to five-cylinder Audi turbo engines to its Zero roadster, most

Below: Exhaust attenuator on the left and a section of the 5in outer pipe used to make the silencers on the right.



Below: Exhaust attenuators can be inserted into the silencers to save a few extra decibels for noise tests.



Below: Silencer inner and outer. Only other elements are wadding to go between the two and a cone to seal the end.





Above: GBS exhaust silencer is typical of a kit car in using an absorption design.

tend to use more familiar four-cylinder designs. With these, the IVA noise test is rarely a problem and it also keeps track day organisers happy.

The key to this is a large repackable silencer. And to understand how it works, it's best to take a quick look at the physics: as the fuel burns inside the cylinder it creates a sharp rise in pressure. The moment the exhaust valve opens, two things happen: this pressure begins to push the burnt gasses out the cylinder and it also creates a pulse that travels down the exhaust. It's worth emphasising that these are two different things. The pulse is effectively an area of high pressure within the gas. It doesn't actually take any of the exhaust particles with it; instead, it travels through them like a wave on the sea.

A lot of production car silencers work by reflecting these pressure waves back on themselves, so the trough of one wave (to some extent) cancels out the peak of another. From an acoustic point of view, this is the most effective way of reducing the amplitude of the wave, but it tends to involve a pretty tortuous path for the exhaust gases, which restricts

their flow and reduces power.

Most kit car silencers, like the ones you'll find on the GBS exhaust, use an absorption design. Here, the gas flows straight through a perforated pipe, surrounded by sound-deadening wadding. The pressure from the wave is partially absorbed by the wadding when it hits the perforated section, but the gas carries on, theoretically unimpeded.

Put simply, the more wadding you introduce – either by packing it tighter into the existing space or enlarging the silencer – the more sound pressure it will absorb. In reality, the turbulence generated by perforated section still introduces a degree of back pressure, but it's relatively low and the absorption principle works across a wide range of frequencies, so the same basic design can be used for a variety of engines.

Dax Cars uses a similar set-up for its Cobra replicas, although the big V8s can prove more of a challenge when it comes to silencing. Each bank of cylinders has its own exhaust system, which starts off with four individual header pipes that merge into a collector. From that point onwards, virtually the

entire length of the sidepipe is basically one large, re-packable silencer.

Dax typically uses a 2in perforated tube inside a 5in outer casing for the silencers, which are fabricated in-house along with the rest of the exhaust system. This gives plenty of room for the wadding between the two pipes, but the company also produces an optional 3in inner pipe that runs less sound absorbing material for those who want more noise.

"With a 2in inner tube, most of our cars come out at 97 or 98dB on the noise test, so they just about get in without any further modifications," explains Dax co-director, Simon Johns. "Failing that, we make exhaust attenuators, which are basically bungs made out of perforated tube, which can be inserted into the silencer to buy you another two or three decibels."

For low-noise track days, the engineers at Dax have created an additional bolt-on system. This takes pipes from the two regular side-exit exhausts and feeds them to a pair of small additional silencers underneath the boot, culminating in a set of tailpipes.



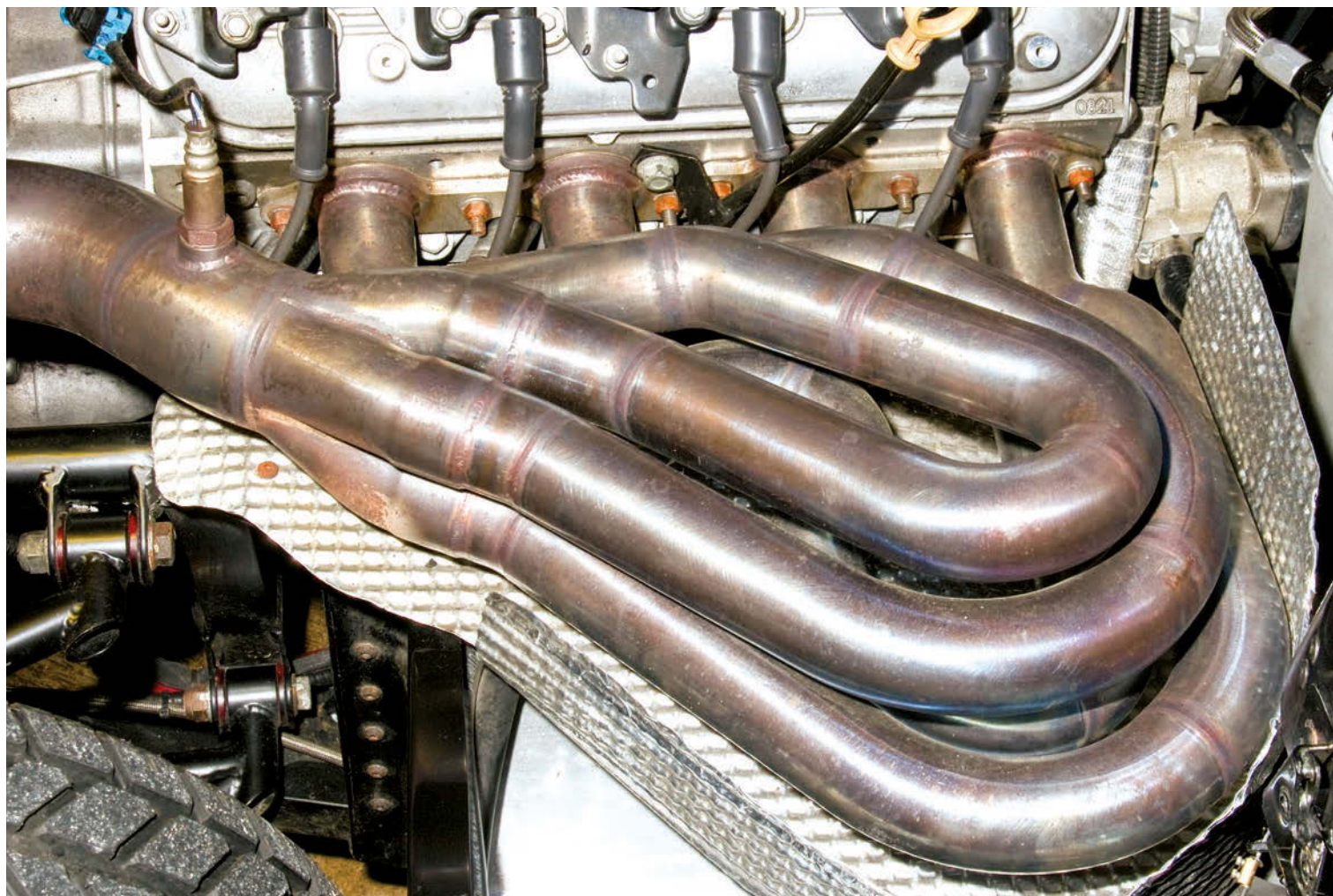
Above: Note the lambda sensor boss. Fuel injection is advantageous for cat-equipped cars.



Below: Specific bend radiuses can be made up by welding sections of straight or curved pipe...



Below: ...which you can see fitted to this GBS Zero.



Exhaust tuning

As well as generating most of the noise, the pressure waves travelling down the exhaust have a significant effect on the engine's power and torque characteristics.

When one of these waves meets a change in cross section it reflects back. For an increase in area, such as the small diameter header pipes going into a collector, this reflection is inverted relative to the original wave, so the high pressure areas become low pressure and vice versa.

Put simply, if one of these low pressure areas arrives back at the exhaust port while the next pulse is emerging it will help to suck the burnt gasses out, improving the engine's breathing. Conversely, if the wave comes back on a peak rather than a trough the high pressure will resist the flow of gas.

Pressure waves travel at the local acoustic velocity, which can be calculated using a fairly simple formula, based on the temperature and composition of the gas. From the engine speed, you can work out how many degrees of crank rotation will be covered per second and, from that, how long it will be before the exhaust valve next opens. Armed with the speed of the wavefront and the time before it returns, you can calculate the distance it will need to cover. Half this 'round trip' distance will give you the optimum length of the primary exhaust pipe for that particular engine speed.

At least, that's the theory. Modelling the wave dynamics accurately is extremely complex, particularly when you factor in pipe geometry and the interaction of multiple cylinders on the same manifold. Nonetheless, for a single cylinder it can be approximated to the following for academic purposes:

$$L = \frac{\text{velocity} \cdot \text{time}}{2} = \frac{\sqrt{\gamma R T} \cdot \left(\left(\frac{60}{N} \right) \cdot \left(\frac{\Phi}{360} \right) \right)}{2}$$

Where:

L = Total primary pipe length starting at the exhaust port (metres)

γ = Specific heat ratio (approximately 1.35 for exhaust gas at 500deg K)

R = Gas constant (approximately J/kg-deg K for exhaust gas)

T = Gas temperature in Kelvin (deg C + 273)

Φ = Desired duration before the wave returns (crank angle degrees)

N = Engine speed (rpm)

This not only provides an extra level of sound suppression for the exhaust, but moves the outlet – where the noise test is conducted – a few crucial feet further away from the engine bay, which is another major sound source.

"We've done a few of them using this technique and we got one of them down to 89dB," comments Simon. Another approach the company has investigated is fitting a removable butterfly valve to the end of the tailpipes – this rather drastic step is said to work well acoustically, but it has a marked effect on the engine's performance.

CATALYTIC CONVERTERS

While the noise requirements for the IVA are very straightforward, things get a little more complicated on the emissions side. To start with, all engines must comply with the visible smoke requirements, which state that they must not emit 'dense blue or clearly visible black smoke' at idle or 'excessive smoke or vapour of any colour during acceleration that would obscure the view of other road users'.

From there on, there's a sliding scale for carbon monoxide and hydrocarbon emissions. Tested at idle and 'fast idle' (between 2500rpm and 3000rpm), the requirements get more stringent as the engines become newer. The major

watershed point, however, is 1 August 1995; from that date onwards, the engines must meet the current MoT emissions standards for new vehicles, which generally means fitting a catalytic converter to the exhaust. And the bad news is that includes engines which are believed to be older, but where there's no definitive proof to confirm their age.

"Generally, testers like to see a log book from the donor with the engine number clearly marked on it," comments Simon Firth. "We've had Ford Pinto engines [last used on cars in 1992] where we've not been able to prove the age of the engine and it has had to pass the full requirements."

Some manufacturers include a date code in the engine number and here the testers will often accept that as proof of age, explains Simon Johns: "We get our engines from Roadcraft and they tend to be an old block with a corresponding number that's been built up using fresh components. Generally, that means we don't need to run catalytic converters. The only exception is if the customer wants one of the LS engines, which are all post '95."

The prospect of having to run a catalytic converter might seem daunting, but it can be a straightforward 'fit and forget' addition to the exhaust. As the name suggests, they act as



Above: Emissions will be tested at IVA and for subsequent MoTs.



Above: You'll also have to abide by noise limits for IVA and most track days.

the catalyst for a number of chemical reactions that allow pollutants in the exhaust to combine with each other to form less harmful substances. In theory, all you need to do is let the exhaust gas flow through the cat and chemistry will do the rest.

To work most effectively, the air-to-fuel-ratio has to be kept in a narrow band around stoichiometry. This has led to the common misconception that you can't run a cat on carburettors – it's true to say that fuel injection will give you more precise mixture control, but depending on the engine and the type of catalyst, it's often possible to get away without it.

"We use motorsport cats on our cars. They're very small, they do an adequate job of emissions control and they're more or less bulletproof," comments Simon Firth. "We can run them pretty much sooted up in normal use – which would ruin a production car cat – then lean them down for the test and they still respond. They don't particularly like running on carbs, but if you use the right cat it should work. These days, I don't think the low density cats we use restrict the power so I can't see much argument for not fitting one."

"The noise requirements for the IVA are very straightforward, things get a little more complicated on the emissions side"

The situation is a little different at Dax. The company tends to use higher density cats for its big V8s and Simon Johns says they can be a mixed blessing: "When we need to fit a cat, we use one that's about 4in in diameter that goes inside the silencer with a boss welded onto the collector section for the lambda sensor. They usually come in densities of 100, 200 or 400 cells per square inch (cpsi) and we use a 400cpsi cat to be on the safe side. Once that's fitted, we don't have any problems with emissions, but you can lose 10 or 15 per cent of your power with a cat and they're not cheap. We've got one on each side – at £300 each once you've built them into the exhaust – so you're paying quite a lot of money to deprive yourself of the power."

Unlike a silencer, there's no actual requirement to fit a cat for the IVA, even if your engine is post-1995. It is extremely difficult, but some engines can be made to pass the full emissions test with careful carb tuning alone, explains Firth: "There are various tricks you can employ, such as bleeding air into the inlet manifold for the emissions part of the test, but it's not easy. In the past we've had them leaned off to such an

extent that they won't pull the 70mph required for the speedo calibration."

SUMMARY

The requirements are exactly the same for bike engined cars. Bike carbs can be trickier to set up for the emissions test and you may find yourself running a larger silencer to meet the noise requirements, but the criteria are exactly the same as those for car engines.

Another major misconception is that kit cars running on a Q-plate only have to meet the most basic (visible smoke) requirements. This is the case for the MoT once the car has been registered, but for the IVA test it still comes down to the age of the engine. And unless you can provide definitive evidence to the contrary, the tester is likely to treat it as a new unit.

It may sound like a bit of a minefield, but most of these problems are easily remedied. Whereas cat-equipped exhausts once tended to look like a snake that had swallowed a barrel, you'd now be hard pushed to spot the difference on most systems – visually or on the dyno. The job of the exhaust may have become more complex, but modern technology means it's no more difficult to engineer. ■

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Between The Lines

A home for everything that didn't make it into the main part of the mag.

TVR's 2017 production sold out

No, it's not a kit car, but its heritage is in our industry which is why the fortunes of TVR are of interest to us. And, in the first six weeks since the 'new' TVR outfit opened its order book, it took over 250 deposits – which accounts for its planned production to the end of 2017.

That's remarkable in itself, but what makes it even more so is the fact that nobody yet knows what the new car will look like, nor its specification. It shows the value of a well-known brand – and the association with Gordon Murray will have done no harm.



Flying Exocets in Hampshire

We occasionally find ourselves at some unusual places for photoshoots, and one of the recent ones was Lasham Airfield where we took photos of the two MEV Exocets featured this month ready for part two of the story in the next issue.

As well as being a place for glider owners to fly their own machines, and newcomers to the pastime to learn the skill, the Hampshire venue also has a museum of gliding history. It

offers weekly tours, in which visitors can learn about machines up to 100 years old – some of which look very unstable and frankly terrifying. Our guide admitted that some of them will never go in the air again, simply because there's nobody brave enough to take them up!

Although we couldn't get the Exocets into the hanger for photos, the cars were able to pose in front of some of the outdoor exhibits – as you'll see in the next issue.



Superkit duo



We did separate photoshoots on two different forms of kit-form supercars one day this month. When we arranged to photograph James Shipperley's DDR Miami – the first customer-built example in the world to be completed, and which you may have been reading about in Running Reports – he suggested inviting his Ultima GTR owning friend James Bartholomew along, too.

From reading James's reports on the Miami, we have been fairly astounded at the progress he

has made with such an ambitious first build. Seeing the quality of the finished result has only compounded that impression. It really is a remarkable achievement, and a story we're looking forward to telling.

And the Ultima? It turned out that we'd actually featured this particular GTR before – although the changes James has made to it since he bought it had rendered it unrecognisable. Both stories are due to appear in coming editions of *Complete Kit Car*.

World's fastest microwave?

While we were at Ultima for this month's cover story, we spotted amongst the tea and coffee making facilities what could possibly be the fastest microwave in the world.

At least, the all-black

Samsung matched the colour scheme of the company's 1020bhp demonstrator, and carried the same Ultima Evolution badging. Could it take a Marks & Spencer ready meal from cold to cooked in 2.3sec?



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